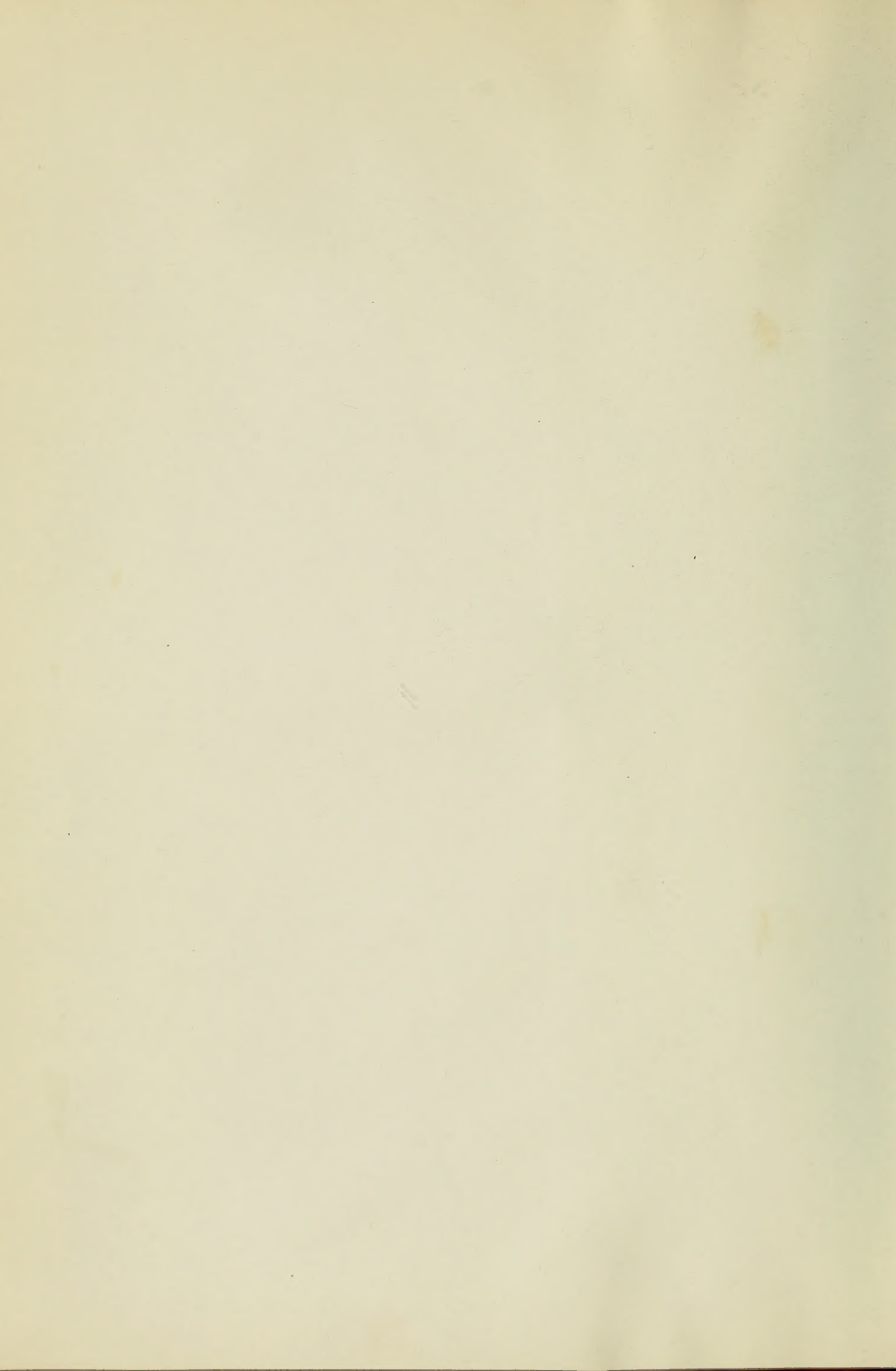




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BIRDS and NATURE

IN NATURAL COLORS

A MONTHLY SERIAL

FORTY ILLUSTRATIONS BY COLOR PHOTOGRAPHY

A GUIDE IN THE STUDY OF NATURE

TWO VOLUMES EACH YEAR

VOLUME XII

JUNE, 1902, TO DECEMBER, 1902

EDITED BY WILLIAM KERR HIGLEY

CHICAGO

A. W. MUMFORD, Publisher
203 Michigan Ave.

1902

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June-Dec.

1902

BIRDS AND NATURE.

ILLUSTRATED BY COLOR PHOTOGRAPHY.

VOL. XII.

JUNE, 1902.

NO. I.

JUNE.

O month whose promise and fulfillment blend,
 And burst in one! it seems the earth can store
 In all her roomy house no treasure more;
 Of all her wealth no farthing have to spend
 On fruit, when once this stintless flowering end.
 And yet no tiniest flower shall fall before
 It hath made ready at its hidden core
 Its tithe of seed, which we may count and tend
 Till harvest. Joy of blossomed love, for thee
 Seems it no fairer thing can yet have birth?
 No room is left for deeper ecstasy?
 Watch well if seeds grow strong, to scatter free
 Germs for thy future summers on the earth.
 A joy which is but joy soon comes to dearth.

—Helen Hunt Jackson.

WAY OF JUNE.

Dark-red roses in a honeyed wind swinging,
 Silk-soft hollyhock, colored like the moon;
 Larks high overhead lost in light, and singing—
 That's the way of June.
 Dark red roses in the warm wind falling
 Velvet leaf by velvet leaf, all the breathless noon;
 Far-off sea waves calling, calling, calling—
 That's the way of June.
 Sweet as scarlet strawberry under wet leaves hidden,
 Honeyed as the damask rose, lavish as the moon,
 Shedding lovely light on things forgotten, hopes forbidden.—
 That's the way of June.

—Pall Mall Gazette.

THE SWALLOW-TAILED KITE.

(*Elanoides forficatus*.)

Hawks in highest heaven hover,
Soar in sight of all their victims:
None can charge them with deception,
All their crimes are deeds of daring.

—Frank Bolles, "The Blue Jay."

The late Dr. Cones enthusiastically writes of the beauty of the Swallow-tailed Kite in the following words:

"Marked among its kind by no ordinary beauty of form and brilliancy of color, the Kite courses through the air with a grace and buoyancy it would be vain to rival. By a stroke of the thin-bladed wings and a lashing of the cleft tail, its flight is swayed to this or that side in a moment, or instantly arrested. Now it swoops with incredible swiftness, seizes without a pause, and bears its struggling captive aloft, feeding from its talons as it flies. Now it mounts in airy circles till it is a speck in the blue ether and disappears. All its actions, in wantonness or in severity of the chase, display the dash of the athletic bird, which, if lacking the brute strength and brutal ferocity of some, becomes their peer in prowess—like the trained gymnast, whose tight-strung thews, supple joints, and swelling muscles, under marvelous control, enable him to execute feats that to the more massive or not so well conditioned frame would be impossible. One cannot watch the flight of the Kite without comparing it with the thorough-bred racer."

The Swallow-tailed Kite inhabits the southern United States as far north as the Carolinas. In the interior, it frequents the Mississippi valley, commonly as far north as Minnesota and westward to the Great Plains. As a casual visitor, it is found in New York, New England and Canada. Though some may winter within the United States, the majority make their winter home in Central and South America.

Swallow-like, this Kite never seems

contented unless coursing through the air. There is its home and it seems to frequent trees but little except during the breeding season, when "flocks consisting of from two or three to ten or twelve birds, but oftener of three, may be seen following one another around, frequently uttering their calls and circling in and out among the tree tops so fast as to make one dizzy to look at them." It captures its food, eats and drinks while on the wing, and some one has said that he often wondered if it did not, at times, even sleep while flying. Its wonderful endurance and power of flight have more than once taken it across the ocean, where it has happily surprised the ornithologists of Europe.

The legs of the Swallow-tailed Kite are so short that they are practically useless for locomotion and it seldom lights on the ground. Like the marsh hawks, it obtains its food while flying close to the ground; or, if its prey be an insect, it pursues it in the air. Dragon flies are dainty morsels for this graceful bird. At no time is the Kite's alertness and control of every muscle in its body more clearly shown than when it is pursuing these insects. The peculiar zigzag and vacillating flight of the dragon fly must puzzle the keenest vision, yet this bird will instantly change the direction of its flight, swooping downward, upward or to the side, without a moment's hesitation, and sometimes in order to secure the fly "it is necessary for it to turn completely over in its evolutions." It also feeds extensively on snakes and other reptiles, insect larvæ and grasshoppers. It is very useful in cotton fields, which it frequents,

Like a lamp

Pride
and ~~the~~
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SWALLOW-TAILED KITE.
(*Elanoides forficatus*.)
 $\frac{1}{3}$ Life-size.

feeding on the cotton worm and other injurious insects. The smaller snakes, however, form a large part of the Kite's diet and they are so frequently seen with these reptiles in their talons that in the south they are sometimes called Snake Hawks. So far as known, they do not capture the smaller birds or mammals.

The Swallow-tailed Kite usually builds its nest in the tallest trees of wild localities, where it is quite concealed by the foliage of the smaller branches. The nest is often constructed with sticks and twigs, but when obtainable, Spanish moss or the fibrous inner bark of the cottonwood is used to make a thick and substantial lining. Some observers state that the material is collected by the female, but that the male assists in the construction of the nest. He is certainly a faithful mate, for during the period of incubation she seldom leaves the nest and he brings food to her. Both birds assist in feeding the young. During this time, both sexes are vicious and will attack any intruder, be it bird, beast or even man.

An interesting habit of this Kite is its method of leaving its nest. It does not

fly from the side, but seems to rise directly upward, "as if it were pushed up with a spring." On alighting, it hovers over the nest and with an almost imperceptible motion of its wings gently lowers itself until the nest is reached.

The antics of the Swallow-tailed Kite during the mating season are particularly interesting. An observer of bird life says: "Of all aerial performances I have ever witnessed, the mating of the Swallow-tailed Kite excels. Ever charming and elegant, they outdo themselves at this season. In Becker County, Minnesota, in the spring of 1886, they chose as their mating ground an open space over the mouth of an ice-cold brook that made its way out from a dark, tangled larch swamp. From my boat on the lake I had an excellent view of them. All the afternoon seven of these matchless objects sported, chasing each other here and there, far and near, sailing along in easy curves, floating, falling and rising, then darting with meteor-like swiftness, commingling and separating with an abandon and airy ease that is difficult to imagine. The next day three pairs were selecting nesting sites."

TO THE BIRDS.

Dear birds, an easy life was yours
E'er man, the slayer, trod
Your earth from all its seas and shores
Went up your praise to God.

What though to weasel, stoat and fox
Your toll of lives you paid,
And hungry hawks might tithe your flocks
That through the woodland play'd?

Short fears were yours and sudden death,
Long life and boundless room;
No cities choked you with their breath,
Or scared you with their gloom.

Pure streams and quiet vales you had;
No snare nor line nor gun
Made war against your legions glad
That wanton'd in the sun.

Hope on, and some day you shall see,
When these ill days have end,
That man the slayer—who but he?—
Is changed to man, the friend.

—Henry Johnstone.

OLD-FASHIONED OUTINGS.

PART I.

The western shore of Gloucester harbor rises in a succession of wooded ridges from the sea-rocks, which redden westward to a degree fully bearing out the sketching-books in the statement that rocks are among the most highly colored of objects.—A sketch is brought home.—“Your rocks are too red.” “Too red!” exclaims the aggrieved sketcher, “they aren’t half red enough. They fairly blazed!” These rocks abound in chasms where trap-dikes have worn away; and when some trap is left, the contrast in color is very striking, but the main charm of this shore is the intimate association of woods with rocks and water.

Next the rocks, as a rule, on high knolls and hedges thinly veiled with a dry, light soil stand the pitch pines, those gnarled and fragrant dwarfs with their stout prickly needles and prevailing shape of a double umbrella. Under favorable circumstances these grow quite tall. The Lone Pine, standing in a low, moist place near the mouth of a creek, attained a height of thirty or forty feet, and its characteristic, interesting shape was long a landmark on that shore. Great was the sorrow when it fell. Fortunately a portrait of it still exists.

The white pines stand back from the water on their great purple trunks, and rain their rust-red needles down among the purple boulders of exactly the same shade, which encumber lowland and hill-side, while trunks and boulders are alike besprinkled with lichens of palest green. Some giants used to shade the new road where it passes the Red Brook; and the perfect level, deep shadow and general dampness somehow recalled the Wood at the Hague, although that is beech forest. Oaks clothe the more easterly ridges or stand alone in open pastures near the shore, but the present tendency of fields which have lain open since our

infancy to grow up to woodland in the last half-dozen years is deplored if not resented.

A ruined stone wall with a hedge-row running down toward the water divides two dear familiar fields bounded by woodland on either hand, and in the row once stood alone a delightful white pine with double crown. Through these fields we pass on our way to certain parts of the shore, and we always had a view of rocky headland, white sails and dancing water, over a sloping foreground dotted with fern and yellow St. John’s wort or golden-rod and asters, according to season, while we paused to pick blue curls and Nuttall’s polygala or spiranthis and little purple gerardia. At present that stylish pine is all mixed up with dowdy maples and poplars, the water view is completely blocked, and we wedge our way with difficulty where we once stepped freely along a tiny track beaten hard in the thin sunburnt pasture grass, running diagonally to a breach in the wall flanked by barberries, and out into the big field which, dipping suddenly to the level of the beach, becomes a grassy swamp. Half way down stands a magnificent pitch pine of most luxuriant growth and very peculiar shape, quite tall, yet stretching one broad curving arm down the slope close to the ground, like a great delicious tufted green mattress. The path, bearing a little to the right, comes out on the beach, while beyond the swamp the land rises in quite a high “hog-backed” hill, of which, after a very considerable dip on the outside, enough is left to form a very bold shore.

Ah, what a view! two views, in fact, from that outpost, the inland slope of that hill eastward, up the harbor, over a bold headland clothed all but the crown in oak woods, beautiful background to a

pretty cove beyond the sloping pasture; and westward past the Rock, along the wooded shore of Norman's Woe to the cliffs at Rafe's Chasm and the sunset. One fairy sunset there was never matched anywhere in my experience, the sky one dome of soft luminous pink, the sea another sky, the earth translucent floating between, like the firmament that divided the waters.

A little way back from that shore ran in our day over hill, dale and brook an old grass-grown road, by each brook a ruined cellar, reputed trace of Acadian dwelling. The hills are among the sharpest little pitches ever seen. Driving at our ease about New England nowadays, we are fain to exclaim: Of a truth our forefathers would seem to have climbed hills by preference (and laid stone walls for exercise). But swamps were their horror, and the poor creatures had to thread their way through mazes of them. There can be no doubt that these wet areas are much restricted now, leaving us but a faint idea of ancestral difficulties in this regard; but even up to our time grandmothers told awe-struck children fragments of half-forgotten stories of the horrors of the swamps. Ours told of an already nameless young soldier, perhaps in the Great Swamp Fight, who, sinking slowly before the eyes of his comrades, pushed his watch to them over the bog, bidding them take it back to his mother. How it was they could do nothing to help him, did not appear.

The Magnolia Swamp lies north of the ridges, and some magnolia trees grow in an arm of it more accessible than the rest. Long before you reach a tree the dead swamp air is redeemed by their fresh fragrance if any flowers are in bloom; and 'redeemed is well said; for the swamp-air of the dog days is rendered doubly oppressive by millions of stiff white spikes borne by the obnoxious clethra in odor "overbearin' and upsettin',"—as Aunt Semantha said widders were in temper. You enter over turf wherein remain divers small deep swamp-holes surrounded by crimson calopogon, yellow-eyed grass, white cotton-grass and the pretty little yellow-horned bladder root. Further in, the path becomes miry, and you have to put

aside the long swaying wands of the swamp loosestrife with its whorls of magenta bloom, and catch at the shrubs to keep you out of the mud. (At this point the poison sumach officiously tenders aid), but the path to your goal, the magnolia tree, leads aside into the bush where the footing is perfectly hard and peculiarly flat; and it doesn't exactly quake and doesn't exactly sound hollow, yet something tells you the bog is beneath, and you are walking on a crust.

To return to the old road: it forded two brooks, the Red Brook which runs into the sea behind Norman's Woe Rock, and the White Brook which runs out (amid much ivy) over the rocky beach by the Dry Chasm. The Red Brook must have been much bigger formerly, for it turned a saw-mill before 1700, and the ruined dam is still to be seen a little way below the ford, where it serves as a bridge. This brook is charged with coloring-matter from the swamps, so that it lines your tin cup with gold (if you chance to have "escaped from the Bastille of civilization"), and it furnishes the most unsatisfying draught ever swallowed. Not a drop ever seems to go lower than your collar-button. It makes one thirsty to think of it. But it was lovely to look at! It ran out of a great bed of cardinal, jewel-weed and raspberry-bushes (which bore monstrous berries because they stood with their feet in the water) and spread out in a big red pool at the foot of a gentle dip in the grassy road; and from the upper level you looked over the brook at a preternaturally steep little pitch beyond, where the road climbed a pine-clad hill, bowing out to the very verge of the dark descent to a ferny swamp, cradle of the brook. The dark background was faced with bright growth, and all in the light of sweet summer mornings with water sparkling in the bay and in the brook! Above, the road turned sharply, broadening into a level glade set round with barberry-bushes, door-yard of a vanished dwelling, and then turned another corner round the cellar and away. This was a cherished haunt. A little side-long, slippery path, parallel with the brook led down a rugged slope of pine

and cedar to a little bluff behind Norman's Woe Rock.

Here we camped out before that way of life became general, except for Uncle Sam. He had just been camping out on a large scale, and so it chanced that two large round tents and sundry new rubber blankets came our way and did not go a-begging. The Red Brook filled our kettles in a shady little glen with sides so steep we had to lower and raise ourselves by the trees, and then it ran away and spread out over the sea-rocks in a series of big, shallow basins—a famous dressing-room—but the way to it was of the roughest, for the red rock scaled off, and literally cut the soles from our boots.

The summer of 1865 was very dry, and so was the brook in many places. Therefore we slept in peace in our tents; but the next year the mosquitoes fairly drove us out, and we were fain to betake ourselves and our bed-sacks down that jagged path to the rocks just above high-water mark where the mosquitoes left us alone until four o'clock. Then they descended in force, and we had to get up. The crows wanted us to get up at three, at which unseemly hour they used to be discussing mussels at the other end of the rough bar between us and the Rock. We, on the other hand, held that meals attended with clamor, especially at such an hour, were "tolerable and not to be endured," and so arose one of those painful differences not uncommon between neighbors who cannot sympathize with each other's needs. Remonstrance growing vain, one of the family employed a rifle; a convincing argument apparently, for the sitting dissolved instantly, and gathered no more.

Having learned the constellations at school, we had been poking our heads out of window at all hours to see things that were not up when we went to bed;

and we thought it would now be very convenient to observe these matters from our beds without stirring, but we never did. Dear Robert Louis in the course of his donkey-drive averred, on the authority of shepherds and old folk, that "to the man who sleeps afiel—there is one stirring hour—when a wakeful influence goes abroad over the sleeping hemisphere, and all the outdoor world are on their feet." But we knew nothing of it, perhaps because we never went to bed with the fowls, and had no cows or sheep to browse around us. At all events—and we were really disappointed—that starry show was thrown away on us. Nobody ever woke.

But we woke one morning in a thick fog, with the Boston boat shouting its way out past us, and water standing in the dimples in our blankets enough to wash our faces very passably if we had had no better chance. When the sun broke through, some one faced it and struck up:

"When the sun gloriously—"
and the rest, like so many troop-horses, bounded and stood in choir-order and went on:

—"comes forth from the ocean,
Making earth glorious, chasing shadows away,
Then do we offer Thee our prayer of devotion:
God of the fatherless, guide us, guard us to-day."

The other verse we sometimes sang at sunset, undaunted in our heyday by its melancholy tone, and then we piled a big fire of the fragrant red cedar to light our supper table and our evening. Pretty silver-mounted trinkets cut from the rich heart of this thenceforth precious wood, and polished on the spot, are still in being, ready, as our camp-laureate had it,

"To sing in praise
Of summer days
In camp at Norman's Woe."

—HELEN MANSFIELD.



THE ALICE'S THRUSH.

(*Turdus aliciae*.)

Alice's Thrush, or the Gray-cheeked Thrush, has an extensive range covering the whole of North America from the Atlantic coast westward to the Plains and northward to the regions beyond the Arctic Circle and is abundant along the Arctic Coast. Mr. Ridgway says: "This bird and the robin are the only species of our thrushes that cross the Arctic Circle to any distance, or reach the shores of the Arctic Ocean. It occurs from Labrador all around the American Coast to the Alutian Islands." It also frequents Siberia. From its breeding grounds in northern North America, on the approach of winter, it migrates southward to Central America, and finally reaches Costa Rica.

Alice's Thrush closely resembles the olive-backed thrush with which it is frequently associated during its migrations. When thus associated, only the trained eye of an expert can discriminate between them. The two may be distinguished, however, by the much stronger buff coloring on the throat and breast, and on the sides of the head around the eyes, of the olive-backed species.

Alice's Thrush is a shy bird during the nesting period and remains within the friendly shelter of thickets and though unseen "their low sweet song is frequently heard." Mr. Ridgway says: "The notes are said to be quite distinctive, the song being most like that of the hermit thrush, 'but differs in being its exact inverse,' beginning with its highest and concluding with its lowest notes, instead of the reverse." However, when their family cares are over, their retiring nature disappears to a great extent and they seem to seek a closer association with the habitation of man and frequent more open places in the vicinity of villages. In his report on "The Birds of Alaska," Mr. E. W. Nelson says that during the period following the breeding season and before

the migration begins, "many are killed by the native boys, armed with their bows and arrows. Their skins are removed and hung in rows or bunches to dry in the smoky huts and are preserved as trophies of the young hunter's prowess. In the winter festivals, when the older hunters bring out the trophies of their skill, the boys proudly display the skins of these thrushes and hang them alongside."

So closely does this bird resemble some of its sister thrushes that it was not until the year 1858 that its distinctive characteristics were recognized and it was given a name of its own. In that year it was described from specimens collected in southern Illinois by the eminent naturalist Robert Kennicott and his sister Alice.

For many years it was considered a rare bird, for in its typical form it is only a migrant in the United States, silently winging its way through the forests to and from its summer home.

Its nests are usually placed in shrubs or low branching trees at a height of but two to seven feet from the ground and in a few instances it has been known to nest on the ground. The nest is usually compact and "composed of an elaborate interweaving of fine sedges, leaves, stems, dry grasses, strips of fine bark and lined with fine grass. Occasionally nests are constructed with mud, like those of the common robin." It is said that this thrush will easily modify its nesting habits to suit the requirements of its environment. In the land of the deer, nests have been found that were wholly constructed of hair and lined with the hair of deer, feathers and some moss.

In our illustration is shown its habit of scratching away the dead leaves that accumulate under the trees, in its search for grubs and worms.

A BIT OF FICTION FROM BIRDLAND.

It was a radiant May day, so invitingly fresh and sunshiny that I found it impossible to stay indoors with any degree of resignation. Far up the hillside sloping southward was a favorite nook, and thither I turned my springing steps, so full of life and gladness that I could hardly contain it all.

Robins and bluebirds along my path saluted me, sparrows caroled from shrub and tree top their sweet, glad-spirited chorus, swallows were skimming the meadow with graceful wing, and bobolinks sang everywhere, jubilant, hilarious, in their "rollicking holiday spirit," evidently intensely amused over some episode of recent date in the blithe bobolink world.

An old orchard of gnarled and tangled trees—a veritable "antique"—ended my ramble; here I threw myself down upon a mossy bank, turning to face the direction whence I had come. Down the valley, with its willow and alder fringed brook threading the meadow flats, I could look far away and over to the distant hills, woods and tilled lands on the other side.

The old orchard stands like the leafy porch to the sylvan halls behind it. Upon either side is a wild unbroken tangle of small growth—saplings of birch, poplar and maple; in front is a stubbly slope cut off by a picturesque brook from the meadows beyond; upon the farther side a deep forest of many years' standing.

Ah, the restfulness of a retreat like this, shut in from the rustle, bustle and petty cares of the world and the everyday scramble for the bread and butter of mere existence! And the witchery of an hour like this—the whole earth steeped in sunshine, the air exhilarant and inspiring with freshness and fragrance, the woodsy odors of the tender new life but just awakened from the torpidity of frost-bound inanition, and the honeyed fragrance of the abundant apple blossoms inviting bird and bee and human flower

lovers.

Evidently the birds were in sympathy with my mood, for there were literally flocks of them all about me; and the air was freighted with the enchanting melody of their rejoicing voices, Robert O'Lincoln as usual making himself delightfully prominent. I threw myself back upon the lap of Mother Earth and mentally rehearsed that characteristic bobolink poem:

"A flock of merry singing birds were sporting
in the grove,
Some were warbling cheerily and some were
making love.
There were Bobolincon, Wadolincon, Winter-
seble, Conquedle,—
A livelier set were never led by taber, pipe
or fiddle."

Presently the soporific influence of the atmosphere and surroundings began to take effect; and, soothed by Nature's lullaby, I fell asleep with Wadolincon, Bobolincon, Conquedle, Winterseble, all in a confused jumble in my brain.

Immediately my companions began a lively discussion about house-building. At first I could not make out even the subject of the conversation, for all were talking together in such determined I-will-have-my-say accents that they outbabeled Babel with the confusion of tongues and senseless racket.

Soon, however, came a diversion, a hawk flew screaming across the arena, and, in the lull that followed, Mrs. Crow seized the opportunity to mount the platform of a tall spruce and call the meeting to order, suggesting that as the subject under consideration was of common interest and importance, it would be more profitably discussed if each were allowed to speak separately.

I was grateful indeed for this timely suggestion of the sable intruder, for, being myself especially interested in the subject under debate, I was anxious for information, and knew that among so divers opinions one might expect new light upon it.

Mrs. Robin Redbreast came forward just then and opened the discussion by expressing her own choice of "use before beauty" and a dry and airy situation.

Mrs. Bluebird liked privacy and retirement from the public gaze, and declared that no place more conspicuous than a hollow post or stump is a fitting home for the bringing up of baby bluebirds.

Mrs. Sparrow, in modest apparel, showed her quiet taste in the matter of home-making as in dress, choosing a lowly nook in the pasture or upon the edge of some grass-fringed bank.

An equally secluded and unsuspected site, with the meadow grasses waving above and daisies and buttercups nodding in the breeze but telling no tales, is the select location of Mrs. O'Lincoln, and rarely indeed does Madam betray the secrets of her home.

"No position is so favorable for nesting purposes as a big knot upon a bridge sleeper," tersely remarked Mrs. Pewee. "My sisters and I make a point of utilizing every bridge in our neighborhood, though we like nearly as well the eaves of a barn if only the Swallows would give us permission to build on their territory.

"Dear me," exclaimed Mrs. Vireo in a distressed tone. "Under a bridge. How plebeian to be sure! Why, how can the precious nestlings sleep in so much noise? I think a swinging cradle indispensable for my babies."

"I, too," chimed in Mrs. Oriole. "I have often watched Mrs. Pewee from our beautiful Elm Lodge and wondered how she could be happy with her home in such a constant jar."

"Come, come," interrupted Mrs. Crow at this point. "I hope no sarcasm is intended. Our taste is for a crasm high up in some dark hemlocks, out of the reach of gunners and harum-scarum boys. We care more for quantity than quality, too, plenty of room but not too much luxury to make our children lazy in getting their own living."

"That would never do us," persisted Mrs. Vireo. "We hold that nothing is too good for the little ones, and early surroundings and influences are everything in cultivating a refined taste, a love

for the beautiful, and the art of fanciful designing. You cannot find anyone who takes more pains than we in this respect."

"O, we all know that the Vireos have plenty of time and means," tartly responded Mrs. Catbird, in an unmistakably sarcastic tone. She, well aware of her own carelessness both in selection of site and manner of building, had not an advanced idea to offer; and, like certain humans, she therefore indulged in scoffing at her betters. "For my part," she continued after a pause intended to be impressive, "I think that those who trust to luck a little more come out just as well in the end and have just as respectable and more independent children."

"Yes, yes," laughed Mrs. O'Lincoln, "if by 'independent' you mean lawless; and fine examples you could furnish us, too. No one will dispute you."

"I like to see materials correspond with surroundings," modestly suggested Mrs. Sparrow, and Mrs. Bluebird added: "If you have proper regard for privacy and modesty in the choice of a site you need give less attention to either materials or the style of your structure."

Madam Cowbird now descended from a perch in the big birch balcony and summarily dismissed the assembly with this rough injunction: "Better be in better business, all of you! Work is better than talk and accomplishes more for the benefit of your neighbors. Theories are well enough, but let me see a practical demonstration of your various ideas. Finish your building and I will come around as critic and inspect your work. I'll warrant that I shall find little to choose among you for all your fine talk."

This characteristic speech filled me with such indignation that I resolved at once to expose the duplicity of the speaker, thus thwarting Madam's wily plans for shirking her own duties.

Springing to my feet and gathering my forces for an energetic and scathing rebuke, I suddenly discovered that the whole company had dispersed, leaving me alone with the beauty and sweetness and quiet gladness of the old orchard.

SARA ELIZABETH GRAVES.

THE CAROLINA CHICKADEE.

(*Parus carolinensis.*)

As one walks through the forest, either in winter when the snow is deep, or in summer when the sun is highest, the stillness will be broken from time to time by the merry "Chicka-dee-dee," "day, day," or "hey-de, hey-de," coming from a little throat only a few feet away.

The Carolina Chickadee is very similar to the blackcapped chickadee with the exception that it has a decidedly shorter tail. Its range is also different, being seldom found north of a line extending from New Jersey, through central Indiana, west to Texas and Indian Territory. The blackcapped is seldom found south of this line.

The nest of this bird is a very cozy affair sheltered in a hollow snag or post. It often takes advantage of the deserted home of a downy woodpecker to make its nest. It also frequently excavates a cavity in some rotten snag or tree trunk. As soft wood is preferred one generally finds the nest in a willow snag. I found a nest of this interesting little bird in a rotten willow snag only a few feet from a small stream. The stump was so decayed that I could easily have pushed it over. The excavation had been recently done, because fresh bits of wood were scattered about the ground. Looking in at the hole, which was about four feet from the ground, I could easily see the nest and eggs in the cavity some ten inches below. Desiring to study it more closely and to obtain a photograph, I carefully pushed my knife through the soft trunk and pried off a large slab. This exposed the cavity and the nest. The nest was a beautiful soft affair, composed of hair, feathers, down, etc., and contained seven small, pinkish white

eggs, spotted with reddish brown most profusely at the larger end.

I then carefully replaced the slab and tied it on securely, trusting I had not disturbed the home too much to prevent further nesting.

When I again passed the nest an hour later and looked in I met the gaze of a pair of small bead-like eyes. The parent bird had returned and had resumed her task, apparently in no way disturbed by the rude attack on her domicile.

Whenever I desired to examine the progress of development of this small family I had but to remove the door and look in. This was easily done, for the latchstring was always out. About eight days after hatching the young left the nest.

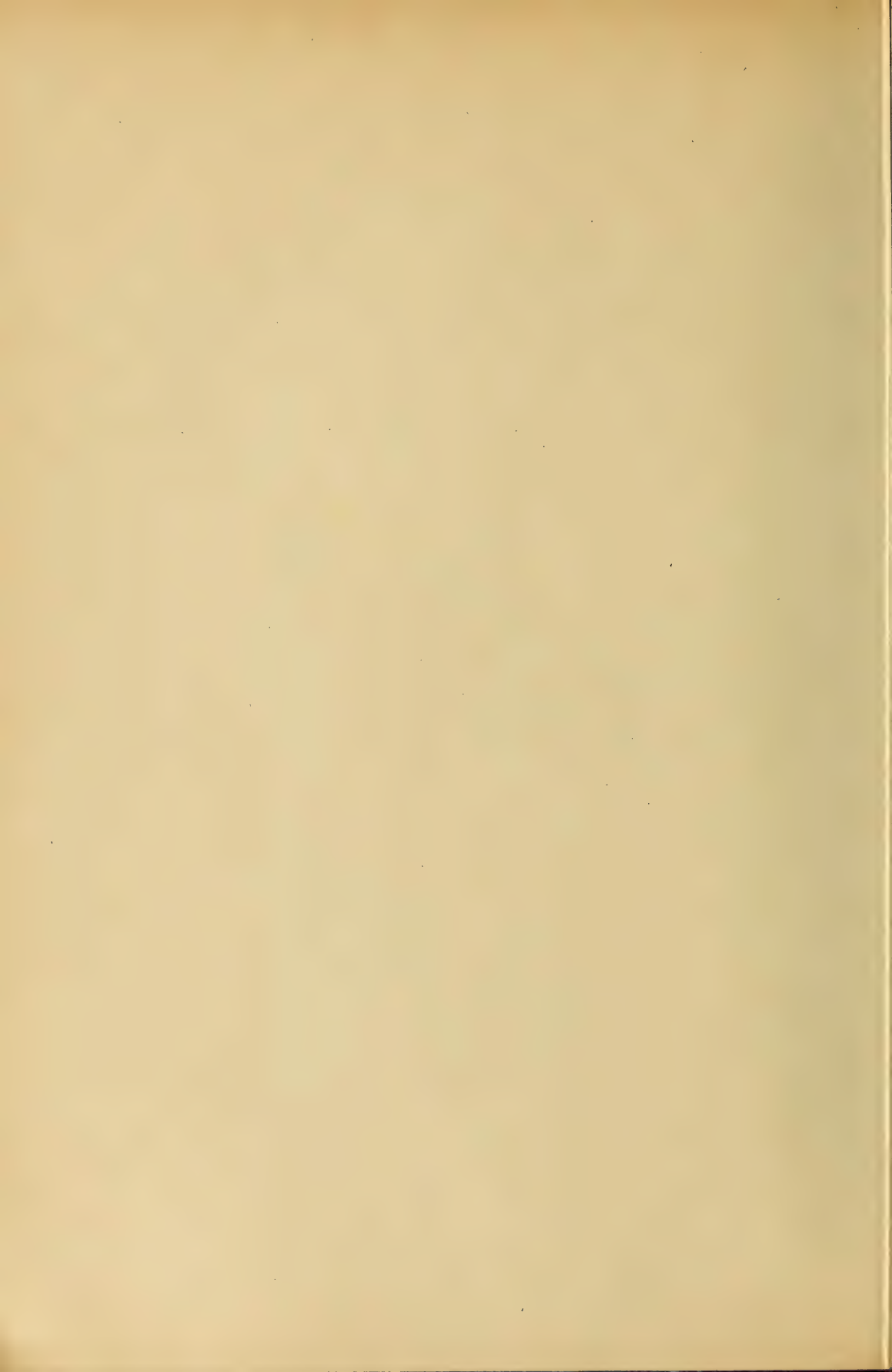
The Chickadee is one of the farmer's best friends. During the egg-laying season of the canker-worm moth it destroys a great many eggs. Examination of the stomach contents shows between 200 and 300 canker-worm eggs in each. It has been estimated that each of these birds destroys 14,000 of these eggs during the month of egg laying. The Chickadee has been accused of destroying the buds of fruit trees, but this is not substantiated. It has been found that whenever it attacks a bud it does so to secure the worm which has burrowed into the center.

These birds are doubly useful because they remain with us the entire year and continue their destruction of eggs and larvæ. The amount of work done by a pair of these birds in destroying eggs and larvæ of injurious insects is more than could be accomplished by any man. They should therefore receive the greatest protection possible.

J. ROLLIN SLONAKER.



CAROLINA CHICKADEE.
(*Parus carolinensis*.)
Life-size.



DICK.

(THE STORY OF A DOG.)

My first remembrance is when I was about two weeks old and lived with my mother, brother and sister in a fancy basket that stood in the corner of a pleasant room in a house in the city of Apokeepsing.

My mistress came into the room followed by another lady, and taking me up she said: "This is the one I am going to give to the little boy."

The other lady took me in her hands and smoothed my curls as she said: "Well, he is a dear little fellow—but what a darkey he is!"

My father was an imported Russian poodle. He was pure white with pink eyes and nose, but he was cross, for the only time I remember seeing him, he growled at me and I hid in my mistress' skirts while she scolded him.

My mother was a Skye terrier, silver gray in color and very intelligent and affectionate.

Our mistress loved us dearly and used to wash us and comb our hair until we were as clean as children.

She was a pretty woman and we all loved her as much as she did us and would run to meet her and kiss her hands and jump in her lap as soon as she sat down.

I used to wonder who the little boy was to whom I was to be given, and when he would come for me; but time went on and I was still with my mother and had nearly forgotten about being given away. One day when I was about five months old, my mistress came into the room and said to her daughter: "Emma, where is Sandy?" I pricked up my ears, for that was my name. She then called me and I ran to her. She took me in her arms and carried me to the street. There was a wagon standing by the sidewalk and in it were a gentleman and a dear brown-eyed little boy who gave a pleased laugh and caught me in his arms, as my mistress held me up to him, and he hugged me so hard that it almost hurt.

Then the gentleman thanked my mis-

tress and she said: "Good bye, Sandy," and I tried to get back to her, but the horses started off and I had to go too.

First we went up a long hill where trolley cars ran and where wagons, horses and people were coming and going all the time.

Then we drove on over a softer road, with less noise and so few houses that sometimes I had to look all around before I could see any, but at last the horses turned in through a gateway and stopped at a large white house.

The little boy called, "Mamma, come and see the new dog!" and out on the stoop came a young lady with a baby in her arms, and she said: "Well! well! what a funny little black fellow!" but she said it with a laugh in her eyes so I knew she liked my looks and when the gentleman put me out on the stoop, I ran to her and she took me up and let the baby pull my curls.

I was so glad to be liked, that I kissed them both ever so many times, until the lady laughed and said: "Here, my son, take this little kisser in and give him some dinner." I was glad to hear that for I was very hungry.

The next day the little boy said he meant to call me Dick, so his mother took my head between her hands and said: "Dear little doggie, your name is Dick now, so don't forget that we mean you when you hear us say it."

I wagged my tail as hard as I could to tell her I would remember and I did so well that it wasn't long before I forgot to expect to be called Sandy and grew to like Dick much better.

I found I had come to live on a farm with cool green grass to run through, cats to chase, chickens to hunt and horses and cows to look out for.

One day I was barking at a cow to make her go into the barn and she turned quickly and kicked me against the fence.

It hurt me pretty badly and I was sick for several days. My new mistress gave me medicine, rubbed my sides and kept

me in the house by her until I felt better.

There was another dog at this house. He was a great St. Bernard called Brian and he used to play with me and scare me almost to death.

His paws were so large that when he struck me in play he nearly knocked my breath away.

There were seven people in this home, the little boy's mother and father, baby sister, their grandfather and a little woman and a young man who did most of the work.

My mistress used to talk to me and teach me how to do things. I soon learned to jump and speak and shake hands, to sit up, lie down, roll over and do other little similar tricks.

When she went out with her horse, I would go too and sometimes when we were alone I would sit on the seat by her side.

One day all were going for a drive and I was to stay at home, but after they were gone, I became so lonesome that I ran off after them and tried my best to catch them.

After I had run a long way, I saw the wagon ahead of me and so I hurried on until I was close to them. I went on for some time without any one seeing me, but at last my mistress turned her head and saw me trotting along through the dust. She looked surprised and shook her head at me, but did not tell the others.

By and by the horse stopped at a house and I was so tired I ran up to the wheel and cried to be taken in.

Then the little boy cried out, "Why, here is Dick, how did he get here?" and his papa said, "Dick, you rascal, what did you follow us for?" I hung my head for I thought I might get a whipping for coming without permission, but the gentleman only laughed and taking me up, put me in under the seat. Wasn't I glad to lie down and rest!

When the baby began to creep she and I used to have great fun on the floor. I would stand still and let her catch me and then jump away and back at her, and she would laugh and crow with delight.

The little boy was in school part of the day, but we always had a good run after he came home.

My mistress used to say to me, "Dick, it is half past three and time for brother to come from school," and then I would run down to the gate and watch for him, and when I saw him coming we would run to meet each other, and such a hugging as I would get!

But for that great dog I would have had a happy life on the farm, but Brian used to bat me around so roughly that I was afraid to go near him, and at last, one day, he struck me with his paw and rolled me over. He then stepped on me, and I was hurt so badly that I could not get up.

My mistress ran out and picked me up in her arms and scolded Brian until he hung his head and tried to lick her hand. Then she said, "Well, I suppose you didn't intend to hurt Dick, and, after all, you are only a dog, and people do more thoughtless things than this."

I stayed in the house nearly all the time until my sides were well, and every day Brian came to the door to ask how I felt and to tell me how sorry he was for having hurt me.

He was an affectionate dog, but very thoughtless, and I often heard our mistress say that he was very different from the majority of St. Bernard dogs, for they were generally very intelligent and trustworthy.

Perhaps Brian had not been well treated during his puppyhood, for that is the time to form a dog's character. By talking to us when we are little we soon learn to understand what is required of us, and, then if people are kind, we always will try to do as they wish.

My mistress used to say that the worst thing a person could do was to abuse a dog or a horse, for both were too good friends to be ill-treated.

There were four horses on the farm, a black mare named Dot, a black horse, Billy, a large bay, Milo, and a young chestnut horse called Archie.

When my mistress and the children went for a drive Milo generally took them, and then I used to go, too. Sometimes I ran ahead to see if the roads

were all clear, and one day I saw a snake going across the road. I ran back as fast as I could to tell Milo to hurry so the children could see it. They were taught not to be afraid of everything, as some children are, but to be interested in all living things, so I always told them when I found snakes or turtles or any odd things out of doors.

One day, soon after I had recovered from Brian's playfulness, I heard the little boy's father say to my mistress: "We will have to send Dick away." She said, "Why so; on account of Brian?" and he replied, "Yes, I think it will be better for Dick to have a more gentle playmate." "Well," said my mistress, "I can send Dick down home."

I was lying on the floor beside her chair, listening as hard as I could and wondering where "down home" was and whether I would be treated well and if the people would like me and a hundred other things. But under all ran the thought that I was to leave my dear little master, the baby and my mistress, and it made me feel so badly that I gave a howl of sorrow before I knew it.

My mistress looked surprised and exclaimed, "Why, Dickie, what is the matter?"

I climbed up in her lap and licked her face and hands and tried to beg her to keep me with her. I must have succeeded, for she hugged me close and said, "Did you hear what I said, my doggie?"

"Well, never mind, Dickie, you will be happier there than you are here."

But I didn't believe that, for it didn't seem as though I could be happy away from these three.

After that I followed her wherever she went, and she used to laugh at me and call me her shadow, but I wanted to be with her all I could before she sent me away.

About a week after this my mistress said, "Dickie, I am going to take you to town this morning." I was delighted, but when a little after the little boy, before he went to school, kissed me ever so many times and said, "Good-bye, my dear doggie," it set me to wondering what was going to happen.

The next thing that occurred was

very unpleasant, for the little boy's father put me in a box and nailed slats across the top so that I couldn't get out.

I did not like to be a prisoner and tried to scratch the slats off, but it was of no use, so at last I sat down and waited to see what would happen next.

As soon as Milo was harnessed the young man put me into the wagon and led Milo to the house.

My mistress and the baby came out, and off we went.

As soon as we were on our way my mistress leaned over and said, "Dear doggie, I am afraid you are not very comfortable in there, but you will soon come out; and she gave me her hand to lick. Then I felt better and sat looking out as we drove along to the city.

Pretty soon we stopped in front of a store and a young man came out. My mistress said to him, "I want to send this dog to New York by express."

Going out, she procured some meat and put it in the box for me, and then she said, "Good-bye, my dear old Dick, you are going where I would like to be myself. Be good and love everyone for me."

After a while a man came for me and put the box in a wagon. He took me a long way through the city to a place where there were cars and locomotives. I was put in a car with a queer little brass check tied to the box, and soon the car began to go very fast indeed.

The next thing I knew a man was hauling my box out of the car, and he put it on a sort of wheelbarrow and took me off across a street or two and to a boat.

After I had been taken off the boat my box stood for a long while in a corner, and I was just about ready to cry myself to sleep when I heard a gentle voice say, "Here he is and it is Dick, sure enough."

It was too dark to see plainly, but I could see a lady, a gentleman and a young girl. The lady continued talking to me while the gentleman broke open the box so I could get out.

At last the slats were off and out I bounced, and the lady said, "Dick, I

am your little master's grandma," and then I was very glad, for I knew I was home at last.

Pretty soon we all four started to walk up a road. The lady led me by a cord around my neck, as she was afraid I would run away, but if she had known how glad I was to find friends she would not have worried about that.

The house we reached was a large one, with beautiful lawns and gardens, and I soon found out that I was to be known as "Brother's dog," and to be petted because I belonged to him.

All through the winter and spring I lived an easy, happy life, with but one break in the quiet days, and that was when my dear little master, mistress and the baby came for a visit.

I was so glad to see them that I jumped and barked until I was all tired out.

How I did miss them when they went away again!

Along toward spring one night we heard bells ringing and men shouting, and I ran out in the yard to see a great glare of fire along the river just a short distance above our home.

A large building was all ablaze, and it burned to the ground.

The next morning a poor little cat came to the place. She had been in the fire and was horribly burned.

Brother's grandpa brought her into the barn and gave her some milk, and after a while she crept into my house to rest.

This poor thing was in such a terrible condition that I felt sorry for her and began to talk to her to find out what I could do to help lessen her pain.

I made her welcome to my bed, and we lived together after awhile, for she said my thick curls made a warm bed for her poor burned sides to rest on, so I tried to help her get well.

By and by the people began to call her "Bob" and say she was "Dick's cat," and that pleased me so much that I began to be quite fond of her, and many a cosy nap we had together.

Her burns healed nicely, but half her ears and nearly all her tail was gone. She looked very queer, but she was a gentle little cat.

I licked her ears for her and kept them clean, so they healed nicely, too.

When she had lived with us a month or two I came around to my house one afternoon and there were three tiny gray kittens.

I was surprised, and asked Bob what they were doing there, and she replied that they were her babies.

Then I was glad and kept them warm for her many times while she was off hunting.

When they grew large enough they used to play tag over my back while Bob and I lay talking together, and after a while I found they liked to have me play with them, and for some reason I enjoyed a good romp as much as they did.

One day when they were all climbing over me one put his paw on my nose so I couldn't breathe, and I took him in my mouth and carried him off on the lawn and gave him a good shaking, but dear me! he knew I wasn't angry and didn't mind it a bit.

Now the long, sunny summer days are coming, and I am waiting eagerly, for when the warm weather comes my dear little master and his mother and baby sister are coming for a long visit. Then I'll be the happiest dog in town, for I'll have to go walking with two playmates and my mistress.

It is strange how few people understand dogs, or any other animal for that matter.

The majority seem to think that all we are good for is to be kicked and abused.

The people at both my homes are as kind to their animals as to their children, and love and care for us just as we need.

I suppose that my history is not a very important one, but it will show how a dog can love and appreciate and tell what a truly happy life I have had so far, because I have been with good-hearted people.

I am not a very old dog yet, but I hope to live many years with my kind friends in the beautiful home I now have, and wish all animals were as well off as,

Yours truly, DICK.
KATHARINE WATKINS LAWSON.



VIOLET-GREEN SWALLOW.
(*Tachycineta thalassina*.)
♂ Life-size.

THE VIOLET-GREEN SWALLOW.

(*Tachyrineta thalassina*.)

The Violet-green Swallow is one of the most beautiful of the Hirundinidæ, or family of swallows. There are about eighty species of the family and they are world-wide in their distribution. These tireless birds seem to pass almost the entire day on the wing in pursuit of insects upon which they feed almost exclusively. They can outfly the birds of prey, and the fact that they obtain their food while flying enables them to pursue their migrations by day and to rest at night.

The Violet-green Swallow frequents the Pacific coast from British Columbia on the north, southward in the winter to Guatemala and Costa Rica. Its range extends eastward to the eastern base of the Rocky Mountains.

Its nest, which is made of dry grass and copiously lined with a mass of feathers, is variously placed. Sometimes the knot-holes of oaks and other deciduous trees are selected. They have also been known to use the deserted homes of the cliff swallow. Mr. Allen states

that they "nest in abandoned woodpeckers' holes, but at the Garden of the Gods and on the divide between Denver and Colorado City, we found them building in holes in the rocks." This Swallow is quite common in Western Colorado, where they have been observed on the mountain sides at an attitude of eight to over ten thousand feet. In "The Birds of Colorado" Mr. W. W. Cooke says: "A few breed on the plains, but more commonly from six to ten thousand five hundred feet" above the level of the sea. He also adds that they begin laying late in June or early in July and desert the higher regions in August and the lower early in September.

The notes of this exquisite bird are described by an observer who says that they "consist of a rather faint warbling twitter, uttered as they sit on some low twig, their favorite perch; when flying about they seem to be rather silent."

The Violet-green Swallows, like their sister species, usually nest and migrate in colonies.

Isn't it wonderful, when you think,
How the wild bird sings his song,
Weaving melodies, link by link,
The whole sweet summer long?
Commonplace is a bird alway,
Everywhere seen and heard,—
But all the engines of earth, I say,
Working on till Judgment Day,
Never could make a bird.

—J. S. Cutler.

A PRETTY HOUSE-FINCH.

My first meeting with the blithesome house-finch of the west occurred in the city of Denver, Colo. It could not properly be called a formal introduction, but was none the less welcome on that account. I had scarcely stepped out upon the busy street before I was accosted with a kind of half twitter and half song that was new to my eastern ears. "Surely that is not the racket of the English sparrow, it is too musical," I remarked to the friend walking by my side.

Peering among the trees and houses, caring little for the people who stopped to stare at me. I presently focused my field-glass upon a small, finch-like bird, whose body was striped with gray and brown, and whose crown, face, breast and rump were beautifully tinged or washed with crimson. What could this chipper little city chap be, with his trim form and pretty manners, in such marked contrast with those of the alien English sparrow? Afterward he was identified as the house-finch, which rejoices in the high-sounding Latin name of *Carpodacus mexicanus frontalis*. He is rather an exclusive little bird, his range being only from the eastern border of the Rocky Mountains to the Pacific coast, chiefly south of the fortieth degree of north latitude in the interior regions.

He is certainly an attractive little fellow, and I wish we could offer sufficient inducements to bring him east. A bird like him is a boon and an ornament to the streets and parks of any city that he graces with his presence. No selfish recluse is he—no, indeed! In no dark gulch or arid wilderness, "far from human neighborhood," does he take up his abode. He prefers the companionship of man to the solitudes of nature. In this respect he bears likeness to the English sparrow, but be it remembered that there the resemblance stops. Even his chirruping is musical as he flies overhead or protests from a tree or a telegraph wire

against your ill-bred espionage. He and his more plainly clad mate build a neat cottage for their bairns about the houses, but do not clog up the spouting and make themselves a nuisance otherwise, as is the manner of their English cousins.

This finch is a minstrel, not one of the first class perhaps, but one that merits a high place among the minor songsters. I am tempted to call him an urban Arion, for there is real melody in his swinging, galloping little aria, running up and down the chromatic scale in a remarkable way. Many times did his matin voluntaries mingle with my half-waking morning dreams, as he is an early riser. His song is quite a complicated performance, considerably prolonged, and delivered with great rapidity, as if the busy minstrel were in a hurry to have done so that he could get at something else.

In my rambles he was found, not only in the cities of the plains, including Denver, Colorado Springs and Pueblo, but also in nearly all the mountain towns visited, Leadville, over ten thousand feet skyward, being, I believe, an exception. In the villages of Red Cliff and Glenwood, both beyond the continental divide, he was the same sprightly citizen, making himself very much at home. My observation is that these finches are more plentiful on the plains than in the higher altitudes and that they seldom venture farther up into the mountains than 8,000 or 9,000 feet. To give an example, in a recent rambling trip among the Rockies a few were seen at Georgetown, which is 8,476 feet above sea level; but my notes contain no record of this species having been seen in any of the higher localities visited.

Much as this finch cherishes the society of man, he is quite wary, and does not fancy being watched. As long as you go on your way without seeming to notice him, he also goes on his way, com-

ing into plain sight and chirping and singing; but just stop to ogle him with your glass and see how quickly he will dart away or esconce himself behind a clump of foliage, uttering a protest which seems to say, "Why doesn't that old fellow go about his own business!"

If in some way the American house-finch could be induced to come east, and the English sparrow could be given papers of extradition, the exchange would be a relief and benefit to the whole country.

LEANDER S. KEYSER.

THE THRUSH'S SOLO.

There's a robin's invitation
And a bluebird's message sweet,
Bidding us to Forest City
With its crooked moss-grown street;

Feathered folks and folks in ermine
Own the city with its trees,
Own the brooks and own the berries,
Own the dewdrops and the breeze.

There, to-day, there was a concert
In a snowy elder bush,
Opened with a thrilling solo
By a prima-donna thrush.

When the sweet brown-breasted singer
Hushed the wonder of her song,
From her listeners rose an encore
Echoing the hills along;

Tambourines the brooks were shaking,
Clapped the palms on every oak
And from old and trained musicians
Warbled rounds of music broke.

Winds that held their breath to listen
Swept adown the vine-clad rooms,
Crowned the little prima-donna
With soft-shaken elder blooms.

—Mrs. A. S. Hardy.

SPRINGS, GEYSERS AND ARTESIAN WELLS.

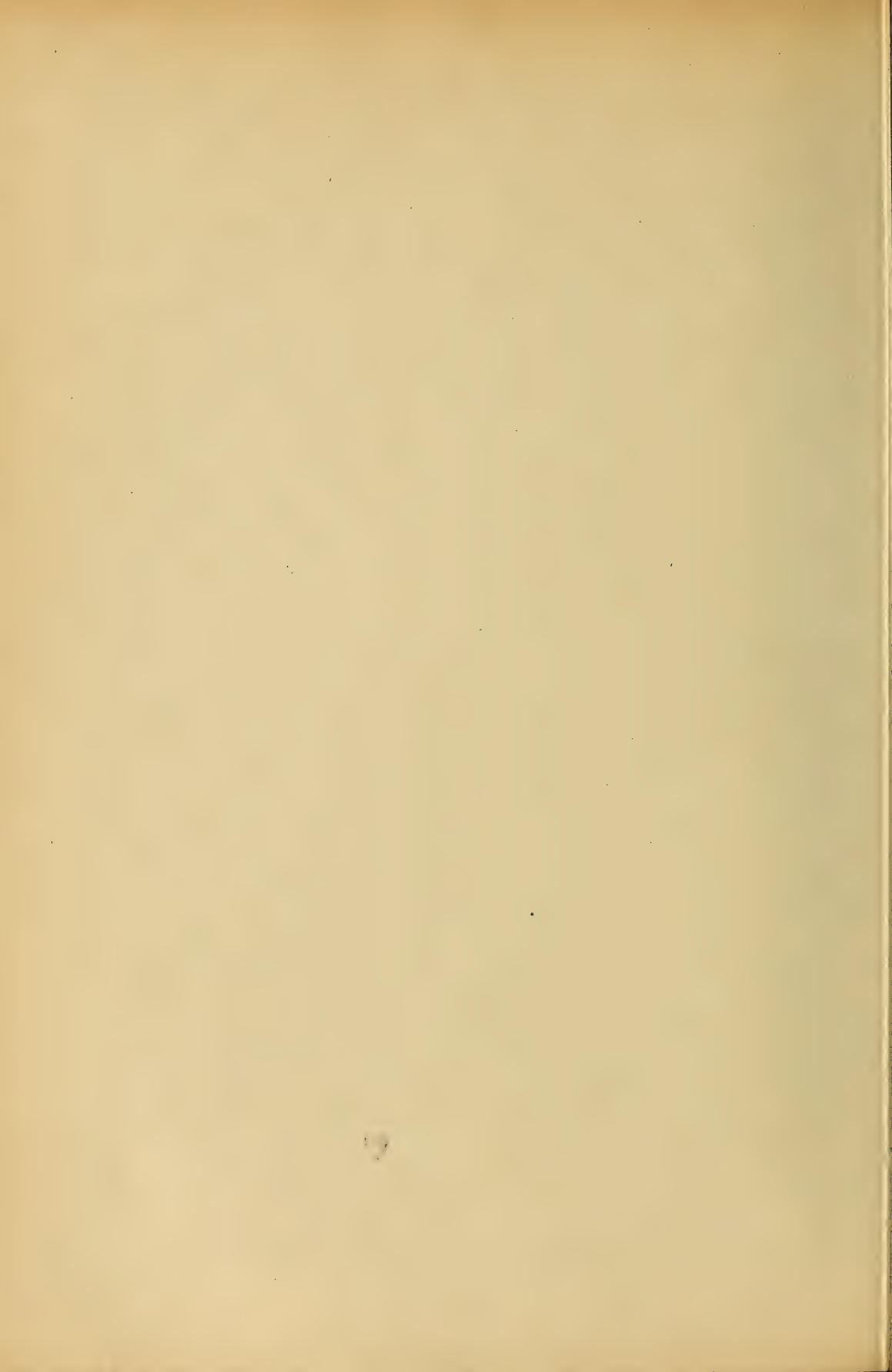
If the earth were transparent as the atmosphere we should see many things of wonderful interest and beauty beneath its surface. If we could see the mineral gems that lie beneath the earth's surface they would rival in beauty the jeweled firmament above us. We should also see rivers and rivulets of crystal clearness and lakes of broad expanse. I can almost hear my young readers saying, "I wish we could look beneath the surface of the earth and see the wonderful and beautiful things it contains, just as we look up to the stars, or out of the window upon a landscape." But let me remind them that nature has been very generous in furnishing rare and wonderful things for them to study and admire to which they can have easy access almost every day. The longest life is too short to study and admire more than a few of the things we may see upon the surface of the earth. Nature has opened a few doors so that we may walk in, study and admire the work she is carrying on in the darkness where the light of the sun never penetrates. Nature makes a free use of sunlight to perfect her most beautiful work upon the surface of the earth, but her most delicate and beautiful work beneath the surface of the earth is wrought by other agencies. Caves have been entered and explored by natural openings, and springs and rivers gush out at the surface of the earth, telling us plainly that they are fed by subterranean fountains and lakes.

Following the order of our topic, let us see what we can find out about underground streams and lakes, and why we know they exist when we seldom see them. We know that large rivers after flowing miles upon the surface of the earth suddenly drop into subterranean channels and reappear after running miles underground. Springs which are always flowing must be constantly fed from some source beneath the surface of

the earth. In boring wells the augers, after going down to various depths, suddenly drop several feet, showing that they have reached a cavity in the earth or a fountain of water; if the water gushes up it is evident a fountain has been struck.

Where does the water come from to fill the underground lakes and reservoirs and keep the rivers constantly flowing? Geologists tell us that all the land surface of the earth was for vast ages under water; that the great oceans that now roll between the continents once covered them entirely, but after long ages mighty internal forces of the earth raised them above the ocean's level. For a long time after the hills and mountains were raised above the surface of the ocean, where the valleys and prairies now are there were lakes and inland seas. The water in these lakes and seas did not all evaporate or find its way to the ocean by the rivers that flowed from them. Deep down into the earth much of it found its way, along the fissures and porous strata, until it reached some impervious stratum, as clay or granite. But as this first underground supply would in time become exhausted, by flowing into the ocean through the rivers they fed, nature has made further provision for keeping up the supply. Everywhere upon the surface of the earth where there is water or moisture evaporation is going on. The sun raises enormous quantities of water in the form of vapor, which forms clouds and descends in rain. A part of this water is soon restored to the sea by the rivers, but by far the largest portion penetrates the earth's surface, as water would penetrate cloth or a sponge when poured upon it. Rain penetrating the earth goes down until it comes to some substance that it cannot penetrate. Then, in trying to find its level, it will distribute itself just as it does upon the surface of the earth. It will find its way into





cavities, large and small, or following some underground channel or stratum, it may burst forth a clear and sparkling spring, or it may flow on a rivulet, or river, and perhaps enter into a great subterranean lake. The underground fountain or lake that keeps an artesian well spouting from year to year may be fed by a stream or lake in the heart of some distant mountain. Some artesian wells cease to flow after a while, showing that the fountain that supplies them is at least partially exhausted. We do not know to what depth water penetrates the earth. Artesian wells have been bored in recent years to the depth of four thousand feet. The temperature of springs and artesian wells is regulated by the temperature of the strata through which the water percolates. The geysers of Iceland send up enormous jets of hot water in the midst of Arctic cold.

The earth is nature's great filter, cleansing and purifying the water from the impurities of the soil. As it passes through strata of gravel or clay, it becomes pure and wholesome to drink. Sometimes water passes through a stratum containing sulphur, iron or magnesia, and so we have mineral wells and springs. There is in Brown County, Illinois, an iron, a sulphur, and a magnesia spring within a few feet of each other.

Having considered underground streams and lakes, artesian wells, and geysers in a general way, we will now proceed to notice some of the most remarkable of each. Of underground lakes we know but little. We cannot enter them as we do a cave, and if we could now and then find an entrance to them, we should find little room between their surface and the strata above it for navigation. We infer their existence, because they are necessary to supply many underground rivers and smaller streams that come to the surface and discharge their waters into the ocean. Another proof of their existence is found in the large areas of country where deep water is struck at a uniform depth measuring from the ocean level. The bogs of Ireland are floating upon underground lakes.

Springs are gems of the first water,

as the dealer in precious stones would say of a perfect diamond. They do not impress us with their size so much as the way they minister to our comfort. But few wells equal them in the variety and purity of their waters. I remember a spring back in New England, which burst forth from a bed of gravel at the side of a hill with such force that it seemed to fairly boil, though icy cold and clear as crystal. So violent was the ebullition that the gravel and pebbles were continually thrown to the surface. Then it ran leaping, gurgling and sparkling down a steep declivity, and was joined on the way by rivulets from three smaller springs, so that when it reached the level of the valley it became a quiet, well-behaved brook, the home of the speckled trout. In places where it spread out over a gravelly bed the birds would light upon the stones and sip the water, and fly away singing joyous notes for so exquisite a luxury. A half mile from its source this brook became quite broad and deep. It ran through a pasture, and cattle came and slaked their thirst.

Hot springs are numerous in all parts of the world. The water of most hot springs has decided mineral properties, for the reason that hot water passing through mineral strata will dissolve more of the mineral substance than cold water. Many hot springs are great resorts for invalids because of their curative properties. The famous Silver Spring in Florida has the dimensions of a small lake, and boats sail over it, and a small river continually flows from it. The inhabitants of Chaudes Aigues, France, use the water of the hot springs to cook their food, to wash their cloths, and warm their houses. The heat from these springs is worth about \$30 per day, as it is equal to the heat produced by five tons of coal.

Few things in nature are more beautiful and impressive than a river bursting from the hillside, its clear water sparkling in the sunlight, seeming joyous at being free from its captivity. Among the most celebrated and beautiful of subterranean rivers is the Sorgues of Daulcuse, in France. It flows for miles through a cave, and discharges thirty cubic yards per second. Soon after it

issues from the cave it divides into numerous irrigating channels, and spreads fertility over an area of more than eighty square miles. Echo River in Mammoth Cave is navigated by boats for nearly a mile, and in some places is two hundred feet wide. The Poik River in Austria flows through the famous cave of Planina. The cave can only be explored by a boat. Professor Schmidt, with three companions, navigated the river for more than a mile. Along the continental shores many outlets of subterranean rivers may be seen. In 1857 all that part of the sea adjacent to the southern point of Florida received an immense eruption of fresh water. Intelligent observers estimated that for more than a month this remarkable inundation of a subterranean river discharged as much water as the Mississippi, and spread all over the strait, thirty-one miles wide, that separates Key West from the mainland of Florida.

Among the wonders of Yellowstone Park the geysers are the most noted. One of them is called Old Faithful, because he always spouts on time. He gives a grand exhibition every hour, whether he has an audience or not. He spouts, and sputters, and hisses and throws a huge column of hot water into the air, and then quiets down and gets ready for another performance. Another geyser in Yellowstone Park is called the Beehive, being cone-shaped like the old-fashioned beehive. It throws up a column of water more than two hundred feet. Castle Geyser is another that throws up a larger column of hot water than either of the above. The falling water has built up a huge crater that resembles a castle, hence its name. But the largest geyser in Yellowstone Park is called the Giantess. The well or orifice through which it sends up its column of water is more than twenty feet in diameter. The steam arises after the water has been ejected. A body of water more than twenty feet in diameter ascends in one gigantic column to the height of ninety feet. Then from the apex of this column five jets shoot up, radiating slightly from each other to the height of two hundred and fifty feet from the ground. The earth trembles under the descending de-

luge of this vast column of water, a thousand hissing sounds are heard in the air, rainbows encircle the summits of the jets with a halo of celestial glory. The falling water plows up and bears away the shelly strata, and a seething flood pours down the slope into the river. It is the grandest and most terrible fountain in the world. Visitors have to wait hours and sometimes days before the geyser will entertain them with an exhibition of its power and beauty.

Commander Ford, of the British Navy, says that one of the geysers of Iceland, called the Stroker, can be excited to action by throwing stones and turf down into the pit, and that the geyser resents the insult by throwing them up. He found that it usually took about forty minutes after throwing in the stones before they were thrown up. It occurred to him that he might send his dinner down and have it sent back to him well cooked. So he wrapped a leg of mutton and a fowl in a cloth and threw them into the boiling caldron, where he would never see them again unless they were thrown up. After waiting the usual forty minutes he began to regret his venture, but the geyser was only seven minutes behind time, and up came his leg of mutton and fowl done to a turn. Aside from the beauty of the columns of water, vapor and steam geysers send up, the waters are all the time depositing carbonate of lime and silica, and building up craters of many interesting forms.

The principle on which artesian wells act is very simple and can be understood by any schoolboy. Though this principle is very simple, there are so many varying conditions that many expensive failures result. Millions of dollars have been spent to get pure wells of flowing water, with nothing to show but holes in the ground or a flow of useless mineral water, but sometimes a good quality of mineral water is obtained. At Henry, Illinois, a flowing well of sulphur water is highly valued by the people, who come many miles to obtain it, while a few miles north of Henry, at Bureau Junction, there is a well of soda water which is very palatable.

Some of the best authorities say that

only flowing wells should be called artesian. I will refer to a few of the many flowing wells. The hot springs in many parts of the world are natural artesian wells, the water being forced up from great depths. It is estimated that there are more than fifty thousand wells east of the Mississippi River from one to two thousand feet in depth, drilled to obtain petroleum oil or the inflammable gas which accompanies it. These are as strictly artesian wells as those that send up water.

Among the most noted artesian wells is the one at Grenelle, in Paris. In boring this well, after going down one thousand seven hundred and ninety-seven feet and passing through a stratum of rock over a subterranean fountain, the drill suddenly fell fourteen feet and the water soon rose above the surface. The temperature of the water coming from this well is eighty-two degrees, Fahrenheit. It is conducted by pipes to the hospital in the town, for heating purposes. The bore in most artesian wells is from three to six inches in diameter, but the one at Passy, near Paris, is twenty-eight

inches in diameter and one thousand nine hundred and twenty-five feet deep.

In town and country a pure water supply is of the utmost importance to the health of the people and in many countries it can only be obtained by deep and expensive boring. Various uses are made of water flowing from artesian wells. In many places it is used to propel machinery. In the desert of Sahara artesian wells have become of great value in making the country near them habitable, as the flow is sufficient to irrigate large areas of land. Two new villages have been built in the desert and two hundred thousand palm trees have been planted about these wells. In the Western part of the United States, where the rainfall is limited, many artesian wells have been bored, the water being largely used for irrigation. In California more than forty thousand acres are irrigated from flowing wells. The average depth of these wells is about two hundred and fifty feet and the average discharge eighty thousand gallons per day.

M. S. HALL.

WHERE WE FOUND THE LADY-BIRDS.

(A TRUE INCIDENT.)

One spring we were cleaning away the leaves and ice from about the roots of a little thicket of white Scotch roses, as we have always called the low-growing, small-blossomed white rose so popular in many country places.

The sunshine had not warmed the air enough to melt the snow and ice which had been formed in early winter about the roots and which held together a mass of oak leaves driven by the wind to this

hiding-place or else put there by the farmer in the fall. One lump of ice about the size of a man's fist had been very hard to dislodge from the rose bushes and as it was brought out by the teeth of our iron rake we picked it up to show to some interested bystanders and to our surprise, and theirs also, we found a number of the small orange-colored beetles usually called lady-birds closely imbedded in this icy prison.

Breaking off a part of the lump which held a half dozen or more of the tiny beetles, we carried it into the house and allowing it to melt in our hands we were surprised to find the lady-birds slowly begin to come back to life and its pleasures. They seemed at first as stupid and drowsy as any other mortals when just aroused from a heavy sleep, but in an hour's time they were flying about the room and finally all gathered on the window where

the sunshine was streaming in with greatest light and warmth.

The children who had at first mourned over the supposed death of these special insect pets of children were never tired of telling the story afterward of how "the lady-birds could freeze to death all winter and then wake up and fly in the springtime."

MARY CATHERINE JUDD.

CHERRY AND I.

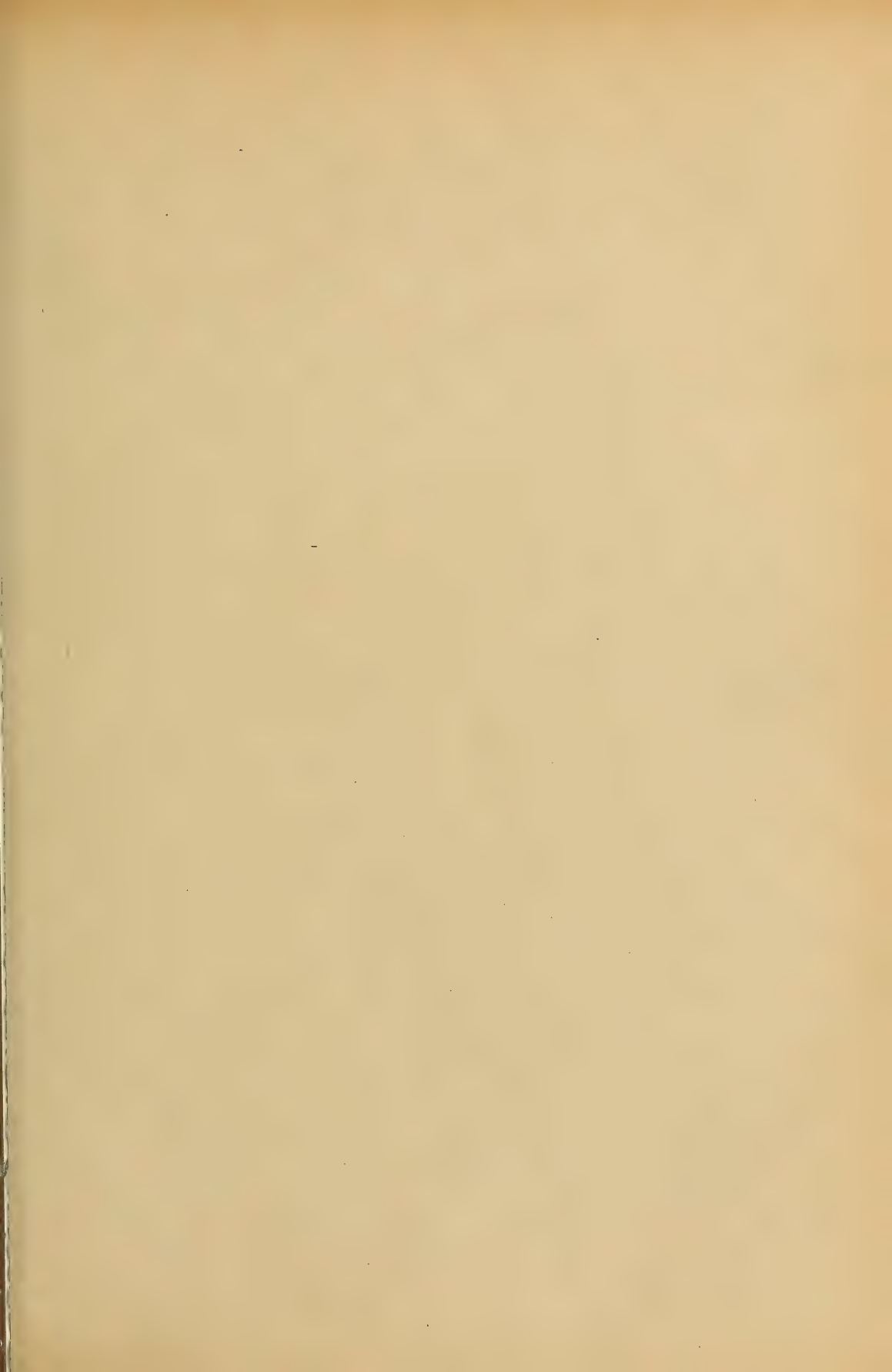
No one knows where the alder boughs lean,
And the willow dips its head,
And the whitest pebbles sleep and dream
In their sandy, wave-washed bed.
Where the mosses creep o'er fallen trees,
As softly asleep they lie,
Lulled by the drowsy hum of bees—
No one but Cherry and I.

No one knows how the cardinal flower,
Velvety, gorgeous and tall,
Was 'prisoned fast in a virgin bower
Of golden thread for a thrall,
That the dodder spun one summer day,
When only we two were nigh;
No one else saw—so no one can say—
No one but Cherry and I.

No one knows where the blue-berries hide,
In the fern beds, thick and green,
Where the mossy floor is soft and wide,
And the sunlight sifts between
Layers of leaves, in the roof o'erhead,
With never a glimpse of sky;
Where the trillium's cup is the wild bee's bed—
No one but Cherry and I.

No one knows where the oriole's nest
Swings by a silvery thread,
Backward and forth by the wild grape pressed,
That drops from the boughs o'erhead.
Where we find the first wild strawberry,
No one could tell, should they try:
For a chestnut heifer is Cherry,
And a country milkmaid, I.

—Elizabeth Walling.





FROM COL. CHI. ACAD. SCIENCES

STARFISHES.

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Asterias ochracea (California.)
Asterias forbesii (Rhode Island.)
Nidorella armata (Panama.)

Asterias vulgaris (Massachusetts.)
Asterias forbesii (Massachusetts.)
Asterina miniata (California.)

STARFISHES.

One of the most unique and interesting branches of the animal kingdom is that division called by scientists Echinodermata, comprising animals familiarly known as starfishes, sea urchins, sand dollars and sea cucumbers. So far as is known no member of this group of animals has ever ventured on land or into fresh water. All are inhabitants of the ocean and are found from the tide-washed shore to the abysses of the sea.

The present article deals with the true starfishes (Asteroidea) and a good idea of the general structure may be gained by a careful examination of a specimen of the common five-finger (*Asterias vulgaris*) so common on the New England coast. It is made up of a central disk or body, from which extend five rays or arms, whence the name starfish. The animal is protected by a hard framework or skeleton, composed of many limestone plates, attached by a tough membrane and covered with a skin. Between these plates there are many small openings through which the water enters the body cavity. The plates are armed with numerous spines, attached by a ball and socket joint. Some of these spines bear little pincer-like organs called pedicellariæ, which are capable of considerable movement. Many of these little organs are arranged in groups about the spines, which swell at the point of attachment to the surface of the starfish, thus forming a shelf or base, around which these organs arrange themselves in the form of a wreath, the spine projecting high above the center. The exact function of these little organs is not known, although they have been seen to catch small animals, such as crustacea, and this is probably one of their duties.

The lower or actinal surface of each arm is deeply channeled and perforated by many holes or pores, through which the little ambulacra or water-feet are thrust. These serve as organs of loco-

motion, of respiration and of perception. These water-feet form a part of the wonderful water-vascular system, which consists of a madreporic body, or sieve-like organ, opening on the dorsal or actinal surface and situated between two rays. It opens into a tube called the stone canal, which enters a circular vessel called the circum oral water tube, surrounding the mouth, and a long radial canal, to which the water-feet are attached, opens from this tube and extends along the inner surface of each ray. The water enters the madreporic body, circulates through the stone canal, the circular and radial tubes, and finds its exit through the ambulacra. The water system is directed and controlled by a set of nerves, extending from a ring of nerve matter surrounding the mouth.

The true vascular or blood system consists of a heart or hæmal canal, which runs parallel with the stone canal from the madreporic body to the oral water tube. A set of circular and radial vessels supplies every part of the animal with the vital fluid.

The digestive system is simple and consists of a mouth, a stomach, which is large and sends a lobe into the base of each arm, and an intestine of greater or lesser length, ending in a small anal opening on the dorsal surface. The cœca or liver consists of two long, tree-like masses, nearly filling each ray and connecting with the stomach by a short duct.

Starfishes are very destructive to the oyster beds along the Atlantic coast of the United States, thousands of bushels of oysters being destroyed in a few days by them. The little starfishes attack the young oysters and as the former increase in size they move about in vast numbers, resembling in this respect the grasshoppers and locusts of the west and being fully as destructive. In a paper in a Bulletin of the United States

Fish Commission, by Henry C. Rowe, it is stated that in 1882 \$90,000 worth of oysters were destroyed in six months and \$9,000 were spent in the same period in catching the starfishes. The method of catching these animals is interesting. Devices called "tangles" and "mops" are used. These consist of a heavy iron frame, to which about twenty small ropes, ending in a large bunch of cotton waste, are fastened. These "mops" are drawn over the oyster beds and the starfishes become entangled in the waste and are then drawn on board the vessel. As many as 1,500 starfish have been taken from a single "mop."

The following account, published in the Evening Register, of New Haven, Conn., April 3, 1884, will serve as an example of the destructive habits of these animals: "It was reported yesterday that between November 1, 1883, and the close of navigation in December, there were caught on oyster beds adjoining the Bridgeport public beds about 15,000 bushels of starfish. Since October 1 they have destroyed over 900 acres. From six to ten steamers have been catching starfish during the past six months, at an expense of \$5,000."

When oystermen first knew of the destruction caused by the starfishes, they spent much time and labor in collecting the injurious animals, cutting off an arm or two and then throwing the mutilated body and dismembered arms back into the water, not knowing that the arms would grow out again. The animals are now collected and used as a fertilizer. The interesting power of reproducing lost arms is well illustrated on the plate, the individual figured having one perfect arm and four new ones just starting to grow.

The method of eating among some of the common starfishes is curious. When the shell of an oyster is too large to be swallowed, the starfish actually projects its stomach from its mouth, surrounds the shell with this everted organ, and digests its prey in this position. The sight presented in an aquarium by a number of these animals in this attitude is truly wonderful and odd. Another interesting performance of a member of this group is that of righting itself when

placed on its back. This is performed in the following manner: One or more of the rays is twisted about until the sucking feet get a firm hold on the ground or the object upon which it is resting; this is followed by a succession of similar movements farther back in the row of ambulacra, so that the whole ray is finally twisted around and lies flat on the ground. The other arms then turn in a similar manner and the starfish is soon "right side up."

Though hidden away in dark corners of the sea, the starfish is able to see, being quite well supplied with visual organs. The end of each ray is slightly turned up and at its summit is situated a little red eye. A long nerve extends from this eyespot to the ring of nerve matter which surrounds the mouth.

The Atlantic and Pacific coasts abound in several species of interesting starfishes, several of which are illustrated on the plate. The most numerous of these is the common five-finger (*Asterias forbesii*), found abundantly on the shores of the New England states. This animal loves to hide among the rocks and seaweed, and a search at low tide will always reveal a host of them. Along the sandy shores of Narragansett Bay they may be collected at low water among the seaweed, where they feed upon bivalve mollusks, such as cockles, arks and clams.

One of the largest and handsomest of the starfishes is the Giant Mountain Starfish (*Oreaster reticulatus*), so common in the waters of the Bahama Islands. This species attains a diameter of fifteen or sixteen inches and is very high in the center. Its upper surface is reticulated by the crossing of the hard parts of the skeleton, and beautiful ornaments may be made by removing the softer parts and leaving only the skeleton, which forms a peculiarly latticed framework. This species is found on both sides of the Atlantic ocean; it is a common starfish in the West Indies, inhabits the coast of the United States from Florida to South Carolina and is abundant on the shores of the Cape Verde Islands.

The most common starfish of the Pacific coast is the Ochre-colored Starfish (*Asterias ochracea*), which ranges from Sitka, Alaska, to San Diego, Cali-

fornia, the last mentioned locality being one of the best. It is a large species, frequently attaining a diameter from tip to tip of the arms of sixteen inches. When alive it is of a rich ochre color or brown, and the surface is beautifully reticulated by numerous club-shaped spines arranged in rows. This species is as much an enemy to the oysters of the Pacific coast as is the common five-finger to those of the Atlantic coast.

Another common starfish of the coast of California is the Vermilion Starfish, which may be collected by thousands at San Diego and Monterey. The body is very broad and the rays short and wide. It is in shape quite suggestive of the foot of a pelican or duck. The upper surface is beset with small, heavy spines, which are arranged in little festoons on the five rays. Its name is very appropriate, for it is of a rich vermilion color, varying from this to rose, yellowish or purple.

A starfish of peculiar design and startling aspect is the Armed Starfish (*Nidorella armata*), which is an inhabitant of the warm waters of the Isthmus of Panama. It is like a star in form, the rays being short and wide. The edge is bordered by large, squarish plates and the upper surface is marked by many little holes, giving it the aspect of a fine sieve. But the most peculiar ornamentation and the character from which the species derives its name is the row of long, cornucopia-shaped spines which extend along the center of each ray from the tip to the center of each disk. Besides this regular row of spines there

are several projecting from the surface of the starfish between the rays. Taken as a whole, the dorsal surface is not unlike a miniature African shield.

During the past twenty years many interesting and curious forms of starfishes have been dredged by the United States Fish Commission Steamer Albatross, in deep water, off the eastern coast of America. Some of the species were the common forms found along the shore, such as the common five-finger (*Asterias vulgaris*), which ranges from low water to two hundred eight fathoms. But the majority were species new to science, which were brought up from a maximum depth of two thousand three hundred sixty-nine fathoms, a depth of about three miles.

One can hardly realize the difficulties attending the gathering of these animals from such a depth. Let us imagine that a dredge is dropped from the top of the Masonic Temple, in Chicago, a height of about two hundred and seventy feet, and drawn along the street to catch such insects, mollusks and other life as might be there. It is manifest that only a small percentage of the fauna would be represented by such a method. The depth mentioned is only forty-five fathoms, and if there is difficulty in securing a representative collection for this moderate distance, what must be the almost insurmountable obstacles when that distance is multiplied fifty times. With all these difficulties, however, the animals of the abysses of the ocean are being collected and classified.

FRANK COLLINS BAKER.

THE FIRE-WEED OR GREAT WILLOW-HERB.

(*Chamaenerion angustifolium*.)

Scattered throughout the world, but more abundant in the temperate regions of America, there are three hundred and fifty species of plants that are closely related and grouped by the botanist as the evening primrose family. By him this family is called the Onagraceæ, possibly derived from two Greek words, meaning wine and a hunt or eager pursuit. The Greek name is supposed, by some authorities, to have been applied to a plant a portion of which when eaten would develop a taste for wine. Even now the roots of some species are used in scenting wine. The word may also be derived from the Greek word meaning the ass, and used here because many of the species bear elongated, erect and pointed leaves resembling the ears of that animal.

This family includes a number of interesting plants. Here are classed the fuchsias or ladies' eardrops, of which there are many brilliant varieties under cultivation as house plants. These are natives of the mountain regions from Mexico southward. Another cultivated plant is the Clarkia, a native of Oregon and California.

Among the more common wild species are the evening primroses, the willow-herbs and the enchanter's night-shade, named Circea in honor of Circe, the enchantress. Why Linnæus should have chosen this plant with which to honor Circe is difficult to understand, for the Circea is an insignificant plant of the woods.

The Fire-weed is one of the most interesting of the wild members of the family. It is abundant in dry fields and along roadsides throughout that portion of North America lying north of North Carolina, Kansas, Arizona and California. With its spike-like racemes of rather broad purple or sometimes

white flowers, it beautifies many waste places from the Atlantic to the Pacific coast. A plant of the Fire-weed is a continuous bouquet, for it blossoms from June to October. The flowers are followed by attractive fruits which are long and slender and when ripe split into four sections, thus releasing the numerous seeds which have a tuft of long cottony hairs by means of which they are wafted by the wind to long distances. Many of these seeds fall where the conditions are not favorable for growth, but they retain their vitality for a long time.

The Fire-weed is a plant of the open country and not of the forest. It must have a great deal of sunshine. When its seeds fall in the deep shade of a dense forest, where the rays of the sun penetrate but a short distance if at all, they cannot grow. But let the woodman or a fire lay low or destroy the noble growth of trees, then there is soon a transformation—the landscape is enlivened by the bright flowers of the Fire-weed. Where the northern coniferous forests have been burned, it is not an uncommon sight to see a Fire-weed plant, from six to ten feet tall, with its broad top of flowers closely contrasted with the blackened remains of a forest monarch. The Fire-weed is an excellent illustration of the perfect provision that is found in Nature for the perpetuation of the species. Its seeds are distributed by both animate and inanimate forces. They are dropped on both favorable and unfavorable soil. If on the latter, their structure is such that the little embryo plant within the seed can lie dormant for a long time. The deep forest is an unfavorable soil for the seed of the Fire-weed, but remove the trees and it can find no better home.



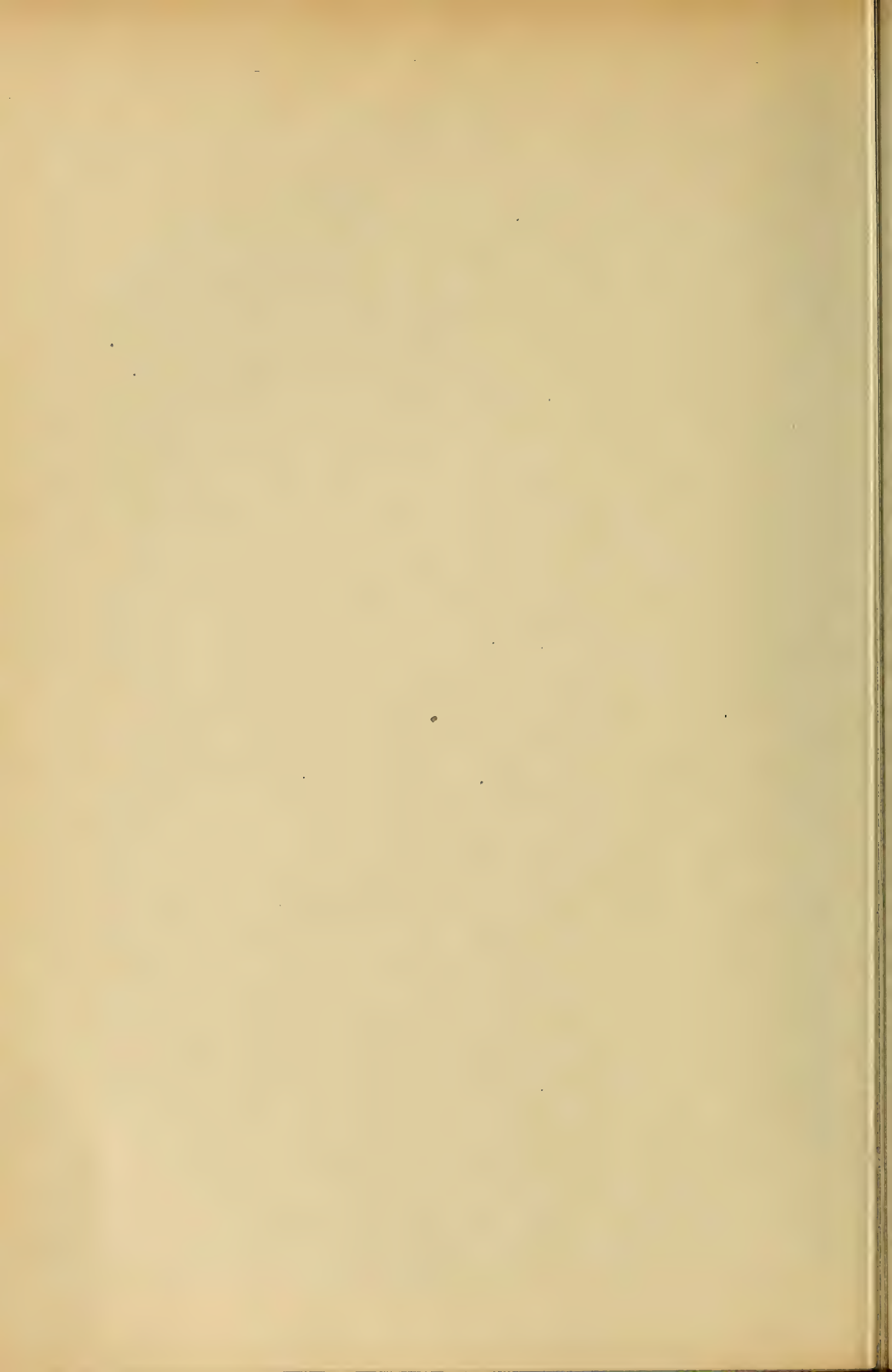
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SEA OR MARSH PINK.
(*Sabbatia stellaris*.)



FIRE-WEED.
(*Chamaenerion angustifolium*.)

FROM "NATURE'S GARDEN,"
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THE SEA OR MARSH PINK.

(*Sabbatia stellaris*.)

The Sea or Marsh Pink, or the Rose of Plymouth, as it is frequently called, is a member of the beautiful gentian family. The genus *Sabbatia*, a name adopted in honor of an Italian botanist, includes about fourteen species, all natives of eastern North America and Mexico.

Our illustration is taken from "Nature's Garden" and Neltje Blanchan, its author, writes as follows regarding those species of the marsh pinks that are confined to the vicinity of the Atlantic ocean: "Three exquisite members of the *Sabbatia* tribe keep close to the Atlantic coast in salt meadows and marshes, along the borders of brackish rivers, and very rarely in the sand at the edges of fresh-water ponds a little way inland. From Maine to Florida they range, and less frequently are met along the shores of the Gulf of Mexico so far as Louisiana. How bright and dainty they are! Whole meadows are radiant with their blushing loveliness. Probably if they consented to live far away from the sea, they would lose some of the deep, clear pink from out their

lovely petals, since all flowers show a tendency to brighten their colors as they approach the coast.

"The Sea or Marsh Pink, whose graceful alternate branching stem attains a height of two feet only under most favorable conditions, from July to September opens a succession of pink flowers that often fade to white. The yellow eye is bordered with carmine. They measure about one inch across, and are usually solitary at the ends of branches, or else sway on slender peduncles from the axils."

This plant is frequently called the American Centaury, but it is not the plant of which Pliny wrote these words: "Centaury, it is said, effected a cure for Chiron (the Centaur), on the occasion when, while handling the arms of Hercules, his guest, he let one of his arrows fall upon his foot: hence it is said that by some it is called 'Chironion.'" Botanists are practically agreed that the plant mentioned by Pliny was a species of the genus *Centaurea*, so well represented in this country by the bachelor's-button of our gardens.

THE WORLD.

Great, wide, beautiful, wonderful World,
With the wonderful water around you curled,
And the wonderful grass upon your breast—
World, you are beautifully drest!

The wonderful air is over me,
And the wonderful wind is shaking the tree;
It walks on the water, and whirls the mills,
And talks to itself on the top of the hills.

—John Greenleaf Whittier.

THE WATER OUSEL.

Washington state can boast of possessing many beautiful birds. Their beauty consists not only in bright and brilliant plumage, but also in sweetness of song. The old favorites are here; those whose liquid notes are so familiar and so dear to every American ear. There are the yellow-vested meadow lark, robin red breast, the blue bird, black bird, linnet, cat-bird, and a great many little warblers whose names I cannot mention. Ah! there is Miss Jennie Wren, for whose sake Sir Cruel Sparrow "with his bow and arrow," slew Mr. Cock Robin. Then we have Mr. Wee Tomtit. Of course we have the-ever-to-be admired humming bird.

Of other birds whose plumage is not noted for its brilliancy, and whose notes are not melodious, we might mention the ebony-hued crow, the noisy yellow-hammer (or flicker), the impudent magpie, the harsh-voiced blue jay, the intrusive kingfisher and the loud-whirring night jar. But the list would be too long should we attempt to enumerate all the birds, great and small, whose home is in Washington.

However, I must not omit from the list the lively little Water Ousel. This bird is not numerous in this state. In fact, the Ousel is quite scarce. It is found nowhere else but along small water courses. Along only a few of the streams is the Ousel met. One of the favorite streams along which this little creature lives is Kettle river, which flows through Stevens county, and empties into the great Columbia. A few may be seen along Colville river at certain times, generally during the summer and early fall months. This bird is not noted for its power of song, nor yet for its beauty of plumage. But withal, the Water Ousel is an interesting and attractive bird.

The Water Ousel of eastern Washington is nearly as large as the ordinary field robin. Its body is short and plump. The tail is short and broad. Though much larger, the Ousel reminds one of

the little wren. Of course the color is not the same; but an Ousel looks like an "enlarged wren." Their bodies are similar and also their actions.

As to color, the Ousel is a brownish-black, dark snuff hue. The plumage of the male is much brighter and more pronounced than that of the female. In some of the males, the color is of a darkish-blue and almost as glossy as that of the male blackbird.

Grace and sprightly action characterize the Water Ousel. It is as quick as a flash. The bird never deserts the stream. No difference how attractive may be the wooded banks, it does not lose itself in the sylvan depths.

Along the pebbly and sandy margin it makes its home. If disturbed, or suddenly frightened, the Ousel will flit up or down the stream. Sometimes the bird will wing its way to the opposite bank. It delights in the water, and spends hours in wading about and seeking its food among the pebbles and sand. The cute little fellow bathes almost constantly. Every few minutes it will dip its plump little body under the water, and then shake its feathers.

The bird is always cheerful and full of action. Never for an instant is the Ousel at rest. It is always on the move, uttering its short, plaintive chirp. The Ousel is not wild, nor even timid. Occasionally one can approach within a few yards and the little chap will eye you sharply in a half saucy way, very much like a starling. If you come nearer, he is off in a twinkling. Whenever the bird alights it invariably takes a dip in the water, chirping gaily to itself.

These birds are rarely seen in pairs except during the mating period. I have never yet been able to discover an Ousel's nest, but those who have made a close study of the habits of this interesting bird claim that they build their nests in the banks, burrowing for that purpose a small hole.

J. MAYNE BALTIMORE.

TOBACCO.

(*Nicotiana tabacum* L.)

Pernicious weed! whose scent the fair annoys,
Unfriendly to society's chief joys.
The worst effect is banishing for hours
The sex whose presence civilizes ours.
Thou art indeed the drug a gardener wants
To poison vermin that infest his plants.

—Cowper: Conversation, line 251.

The tobacco plant is a tall herbaceous annual with large simple leaves and terminal inflorescence, belonging to the nightshade family (Solanaceæ), the members of which resemble each other in that they are more or less poisonous and in that they have a disagreeable, nauseous, heavy odor.

There are several species of tobacco, of which the above is the most highly valued, and they are all natives of warm countries, as southern Asia, India, South America and the West Indies. Tobacco is very extensively cultivated in nearly all warm countries, especially in the southern United States and the West Indies.

The history of the cultivation and use of tobacco is shrouded in uncertainty. Some authorities affirm that it was extensively used for smoking and as snuff and cultivated on a large scale in China, many centuries before the discovery of America. Meyen, the botanist, in studying ancient Chinese sculptures noticed the same form of pipe in use at the present time. Even if this be true, and the statement is questioned by other authorities, the fact nevertheless remains that tobacco was unknown to Europeans until after the discovery of America. Columbus found that the natives of the West Indies smoked cylindrical rolls of tobacco leaves wrapped in maize leaf, to which the name "Tobako" was applied. This name was also given to the tobacco tubes used by the ancient Mexicans. That tobacco was employed since the remotest antiquity by the natives of the western continent, from South America to Canada, has been satisfactorily proven from the examination of burial mounds. In 1492 the natives of Cuba used tobacco for smoking, both as a nar-

cotic stimulant and to drive away mosquitos, as snuff and as a medicine.

The monk Romano Pane, a companion of Columbus, gave the first description of the plant. Gonzalo Hernandez de Oviedo was the first to bring seeds to Spain, where tobacco was cultivated as an ornamental plant until Nicolo Menardes began to extol its medicinal virtues. Soon thereafter it began to be used for smoking and as snuff. Shakespeare makes no reference to the use of tobacco, though it was well known in England during his time. The price was very high and it was used in small quantities by the rich only. The pipes used for smoking tobacco were very small and are known to antiquaries as "elfin pipes." The smoke was expelled through the nostrils and not the mouth, as this produced the most pronounced narcotic effect.

It seems that from the very first strong efforts were made to prevent the use of tobacco, excepting as a medicine. Popes Urban VIII and Innocent XI issued bans without effect. Priests and the sultans of Turkey declared smoking a crime; Sultan Amuret IV decreeing its punishment by the most horrible death. In Russia during the earlier part of the seventeenth century the noses of smokers were cut off. King James I of England issued a "Counterblaste to Tobacco" in which he described its use as "a custom loathsome to the eye, hateful to the nose, harmful to the brain, dangerous to the lungs, and in the black, stinking fume thereof nearly resembling the horrible Stygian smoke of the pit that is bottomless," to which all users of the weed are condemned. All opposition was of no avail and the use of tobacco has increased steadily up to the present time, and is still on the increase in spite of all

boasted civilized progress. Turks and Persians are the greatest smokers in the world. In India all classes and both sexes smoke; likewise in China and Japan. When it was found that even the most cruel death penalty did not prohibit, efforts were made to check its use, and to this effect some ridiculous laws were made. For example, according to a Puritan Blue Law it was a criminal offense to smoke within ten miles of any habitation. Yet it will be recalled that tobacco was extensively cultivated in the colonies, and history informs us that England sent shiploads of "fair maidens" to America to be bartered for with tobacco leaves. Each eligible Puritan planter had the privilege of choosing a maiden who became his property in exchange for from forty to as much as ninety pounds of good tobacco. This barter is referred to in the opening chapters of that interesting novel "To Have and to Hold," by Mary Johnston.

Historically it is stated that Francis Drake, and Sir Walter Raleigh the gallant favorite of Queen Bess, introduced the custom of smoking into England. One day a servant on entering the study in which Sir Walter was quietly smoking, believing his master on fire, rushed forward and dashed a bowl of water over him. It is also stated that Sir Raleigh made a wager that he could give the weight of the smoke made from a pipe full of tobacco. He carefully weighed the tobacco before putting it into the pipe, smoked it, and then weighed the ash; the difference he said was the weight of the escaped smoke. The wager was, however, not justly won, as Raleigh did not take into consideration the oxygen of the air which entered into chemical union during smoke formation.

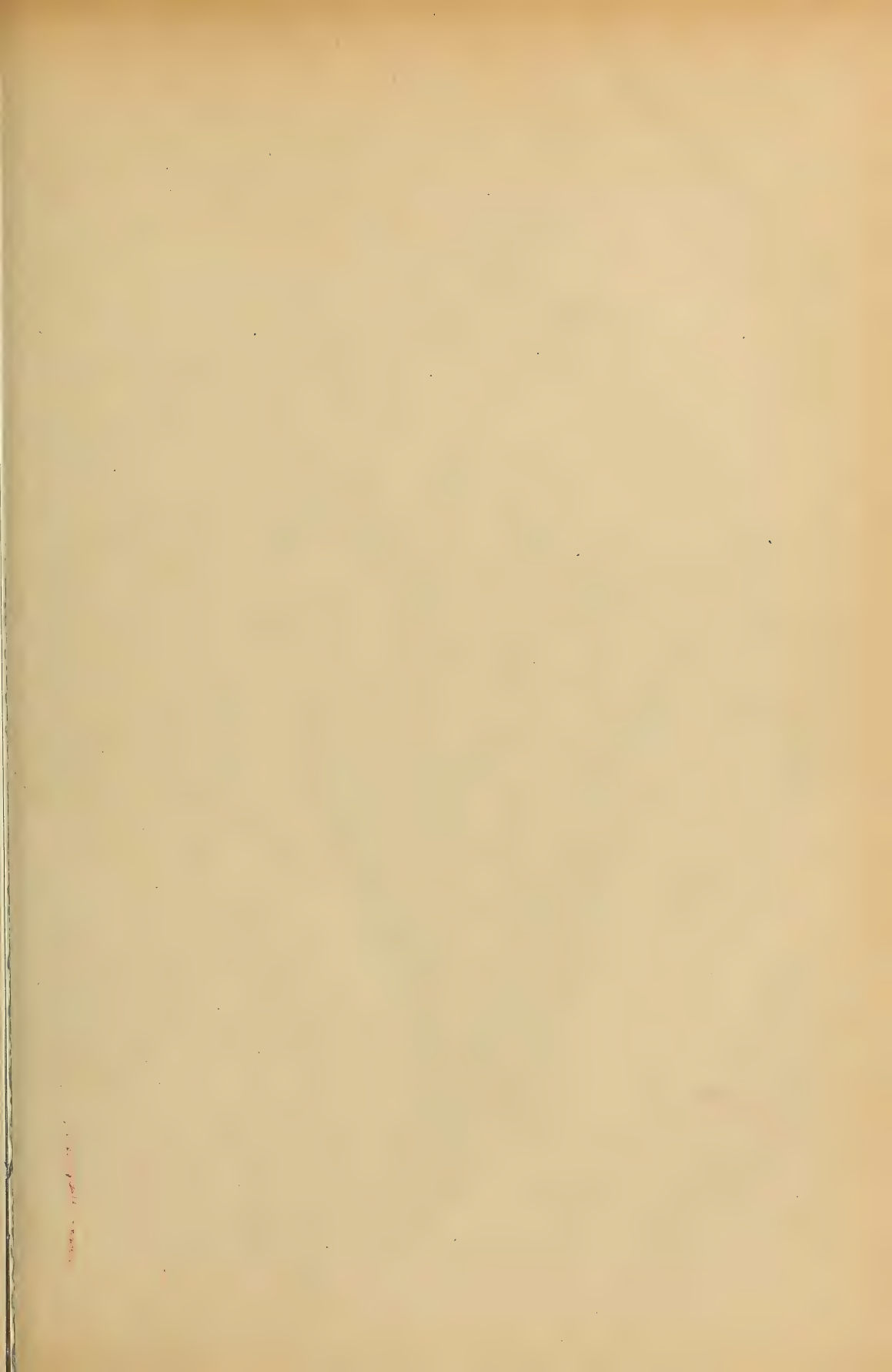
Tobacco requires rich soil and careful cultivation. The seed is sown in a hotbed or in a sheltered place in the open. The plants are set from April to June. The ground is carefully tilled, freed from weeds and the plants watched for cut worm and the big green tobacco worm, which are very destructive. Worms and eggs must be removed and destroyed. To increase the size of the leaves and hasten maturity, the flowering tops are

broken off. When the leaves are matured, which is indicated by a yellowish mottling, the plants are cut off close to the ground, fastened in groups of six to eight and dried. Drying must be done carefully, as upon this depends the aroma of the tobacco. The leaves are also taken from the stalks and dried. In either case they undergo a "sweating process," which must be carefully regulated. According to recent observation the sweating process, which develops the aroma, is initiated by microbes and that the special aroma of each brand or culture variety of tobacco is the result of the action of a certain species of microbe. German scientists have succeeded in developing the flavor or aroma of Havana tobacco in tobacco raised in Germany by adding the sweating microbe of Havana tobacco. Further experiments in this line are in progress.

At the present time tobacco is cultivated on an enormous scale, the United States producing more than all European countries put together. Southern England is well suited for tobacco growing, but since 1660 it has been unlawful to grow tobacco for use, because of a statute then passed in favor of the American colonies, which law, remarkably enough, has not been repealed. The West Indies produce enormous quantities of highly prized tobacco, the Havana tobacco and cigars having a world-wide fame for delicacy of aroma.

Tobacco is prepared for use in various ways. The leaves are more or less finely cut for smoking, powdered for snuff, pressed into various forms for chewing and rolled into cylinders for smoking. The leaves may be used pure or flavored with different substances, as licorice, syrup and molasses. Tobacco is also extensively adulterated with other leaves, as cabbage, cherry, peach, carrot, beet, etc. The very poor employ various substitutes, as red clover heads, dried corn silk, various leaves, even finely cut hay. Enterprising boys may be seen smoking dried cornstalk pith, twigs of the grape vine and other porous plant branches:

The price of crude tobacco and prepared tobacco varies greatly, depending upon the quality, judged by the delicacy





TOBACCO.
(*Nicotiana tabacum*.)

of the aroma, the quality of the leaf and the manner of preparation. Some flavors are not the result of the sweating or curing processes, nor yet due to the quality or variety of the tobacco, but to foreign substances added or to the modification of the curing method. The peculiar flavor of the so-called "Latakia tobacco" is due to the smoke made of the wood of a pine (*Pinus halopensis*), to which it is exposed for several months. This tobacco is said to consist largely or wholly of the flowering tops and even the seed bearing capsules. In the manufacture of cigars and better grades of smoking and chewing tobacco the mid-ribs are removed, but are not thrown away, but generally added to the cheaper grades of smoking tobacco and snuff tobacco. Crude as well as prepared tobacco is subject to deterioration after curing. For example, Havana cigars pronounced of excellent quality on leaving the factory will deteriorate in flavor and aroma after having been stored for some time. This is supposed to be due to the development of a microbe producing a different aroma.

No substance, whether animal, vegetable or mineral has been the cause of so much discussion and variation of opinion as to its utility as tobacco. As one extreme may be mentioned an eminent older botanist who questioned the desirability of the discovery of America by Columbus because as a result was introduced into the civilized world this poisonous weed. Others again cannot find words suitable to laud its virtues, considering it a plant especially created for the benefit and pleasure of man, without which life would be dull and profitless. Similar differences of opinion exist today. To get a reliable opinion on the value of tobacco one must not take the fanatical rantings of those who believe every crime is to be laid to the use of tobacco, nor yet the addle-brained vaporings of those whose systems have been for years steeped in nicotine and the oil of tobacco. As an example of the latter may be cited Kipling's poem, "To My Lady Nicotine."

The use of tobacco may be summarized as follows: Tobacco contains a very powerful poison, nicotine, named

after Jean Nicot, the French ambassador to Spain, who was instrumental in introducing the plant in Spain and France. Further, it contains oil and odoriferous volatile substances. To one not accustomed to the use of tobacco even very minute doses of nicotine (1-7 gr.) produces severe symptoms of poisoning, accompanied by very depressing nausea, vomiting, feeble pulse, muscular weakness, extreme pallor and cold sweat; in brief, there is an "all gone" feeling. As a rule the system recovers quite rapidly from the awful depression. A tolerance to the effects of tobacco is readily established, as all who are addicted to its use can testify. I have seen a tobacco chewer swallow the entire quid without any noticeable ill effects.

All unprejudiced authorities are agreed that the habitual use of tobacco acts injuriously upon the system, no matter in what form or manner it is used. It is stated that there is no nicotine in tobacco smoke, that is during the combustion the nicotine is changed chemically, but it is nevertheless true that there are more or less poisonous gaseous compounds in the smoke. Not only is the tobacco habit injurious to the system, but it is also nasty and filthy. The tobacco stench not only permeates the clothing, but also the entire system, the breath and the atmosphere about the users of tobacco. While all tobacco habits are filthy, there are degrees of filthiness. "Snuff dipping," which is extensively practiced by men and women of the poorer classes of the south, is unquestionably the most filthy habit. A stick moistened with saliva is dipped into snuff tobacco and rubbed on gums, teeth and tongue. Next in filthiness is the old fashion of putting snuff into the nostrils; a habit which we are pleased to note is rapidly dying out. Next follows the chewing habit, which is very extensively practiced by laborers, with whom smoking is inconvenient or forbidden; as sailors. I remember an inveterate user of tobacco who smoked and chewed at the same time; he kept a quid in his mouth during his meals and took a big mouthful just before retiring. The breath of tobacco chewers is sickening, and the discolored teeth and tobacco stained mustache and beard is dis-

gusting to behold, to say nothing of the filthy expectoration. Of the various forms of smoking the cigarette habit is the most disgusting and the most injurious. Cigarettes are extensively smoked by young boys, and those who continue on a large scale become physical and mental weaklings and criminals. Pipe smoking, as already indicated, dates back to remotest antiquity. Pipes with short stems are more injurious because more poisonous volatile substances are inhaled. The long stemmed pipes of German students are less injurious. In a short time the bowl of the pipe becomes saturated with tobacco oil and emits a horrible stench. Cigar smoking is usually considered less vulgar and less disgusting than smoking a pipe, but there is certainly nothing more disagreeable to the nostrils than the conglomerate stench from a poor cigar. The well diluted aroma from a good cigar is very pleasant at a distance.

The injurious effects resulting from the continued habitual use of tobacco may be summarized as follows: If the habit is begun very early in life (five to ten years) the mental, moral and physical development is checked or stunted. At all times the habit is apt to produce chronic dyspepsia; the heart's action is weakened; there will be palpitation, irregularity of beat and sooner or later there is fatty degeneration; that is, there are a series of changes in the heart designated as "tobacco heart." Those with tobacco heart cannot undergo the usual hardships and they are more apt to succumb to disease. The optic nerve and retina are acted upon, producing weakness and dimness of vision known as "tobacco amblyopia," which may result

in total blindness. The mental powers are lessened; there will develop various neuroses, twitchings, tremblings of hands, etc. One of the most common results is "smokers' sore throat," which cannot be cured unless the use of tobacco is discontinued.

Medicinally tobacco is but rarely used now. With non-smokers it is useful to relieve asthma. Formerly it was quite extensively employed in spasmodic affections and in parasitic skin diseases. Tobacco will be excluded from the next issue of the United States Pharmacopœia.

A few words in regard to anti-tobacco and anti-cigarette crusades. They are too generally conducted by those who in their efforts approach the fanatical and who are greatly lacking in scientific learning and who therefore cannot present the subject in a rational and effective manner. If parents will set a good example and teach the true injurious effects of tobacco and tobacco habits to their sons and daughters, they will in all probability not be tempted to use tobacco. All children need careful watching by intelligent parents in order to keep them from acquiring bad habits. This does not apply more nor less to a possible acquisition of the tobacco habit than to any other habit. An illy fed, neglected boy, who is allowed to roam the streets and gutters, who chooses his own companions and who never receives any good advice or kind words from any one, will very likely learn to smoke, besides acquiring other bad habits.

Description of Plate: *A*, flowering stem; *1*, floral parts; *2*, stamen; *3*, pollen; *4-8*, ovary and pistil; *9*, *10*, seed.

ALBERT SCHNEIDER.

Among the beautiful pictures
That hang on memory's wall,
Is one of a dim old forest,
That seemeth best of all.

—Alice Carey

BIRDS AND NATURE.

ILLUSTRATED BY COLOR PHOTOGRAPHY.

VOL. XII.

SEPTEMBER, 1902.

No. 2

SEPTEMBER.

O golden month! How high thy gold is heaped!
The yellow birch-leaves shine like bright coins strung
On wands; the chestnut's yellow pennons tongue
To every wind its harvest challenge. Steeped
In yellow, still lie fields where wheat was reaped;
And yellow still the corn sheaves, stacked among
The yellow gourds, which from the earth have wrung
Her utmost gold. To highest boughs have leaped
The purple grape,—last thing to ripen, late
By very reason of its precious cost.
O Heart, remember, vintages are lost
If grapes do not for freezing night-dews wait.
Think, while thou sunnest thyself in Joy's estate,
Mayhap thou canst not ripen without frost!

—HELEN HUNT JACKSON.

Graceful tossing plume of gold,
Waving lowly on the rocky ledge;
Leaning seaward, lovely to behold,
Clinging to the high cliff's ragged edge;

Burning in the pure September day,
Spike of gold against the stainless blue,
Do you watch the vessels drifting by?
Does the quiet day seem long to you?

—CELIA THAXTER, in "Seaside Goldenrod."

THE PALM WARBLER.

(*Dendroica palmarum.*)

Then tiny warblers flit and sing,
With golden spots on crest and wing,
Or, decked with scarlet epaulette
Above each dusky winglet set,
They hunt the blossoms for their prey
And pipe their fairy roundelay.

—ROSE TERRY COOKE, "My Apple Tree."

There are two varieties of this species, the Palm or Red-poll Warbler, and the yellow palm or yellow red-poll warbler. The latter is a native of the Atlantic States and breeds from Maine northward to Hudson Bay. The former frequents the interior of the United States and migrates northward as far as the Great Slave Lake. It is seldom seen in the Atlantic States except during its migrations.

In this connection the account of Mr. William Dutcher, regarding the first observation of the Palm Warbler in Long Island, is of interest. It is the more interesting because it partially answers the question so often asked, "Where do the birds die?" Mr. Dutcher says, "During the night of the twenty-third of September, 1887, a great bird wave was rolling southward along the Atlantic coast. Mr. E. J. Udall, of the Fire Island Light, wrote me that the air was full of birds. Very many of the little travellers met with an untimely fate, for Mr. Udall picked up at the foot of the light house tower, and shipped to me, no less than five hundred and ninety-five victims. Twenty-five species were included in the number, all of them being land birds, very nearly half of which were Wood Warblers. Among them I found one Palm Warbler."

Both varieties winter in the Southern States that border the Atlantic ocean and the Gulf of Mexico, in Mexico and in the islands of the West Indies. While both birds are often seen in the same flock during the winter, the Palm Warbler is much more common in Florida than is the eastern cousin. When together the two forms may be readily distinguished by the brighter yellow of the yellow palm warbler.

Three of the large family of Wood

Warblers may be called the vagabonds of the family, for they do not love the forest. These are the Palm, the yellow Palm and the Prairie Warblers.

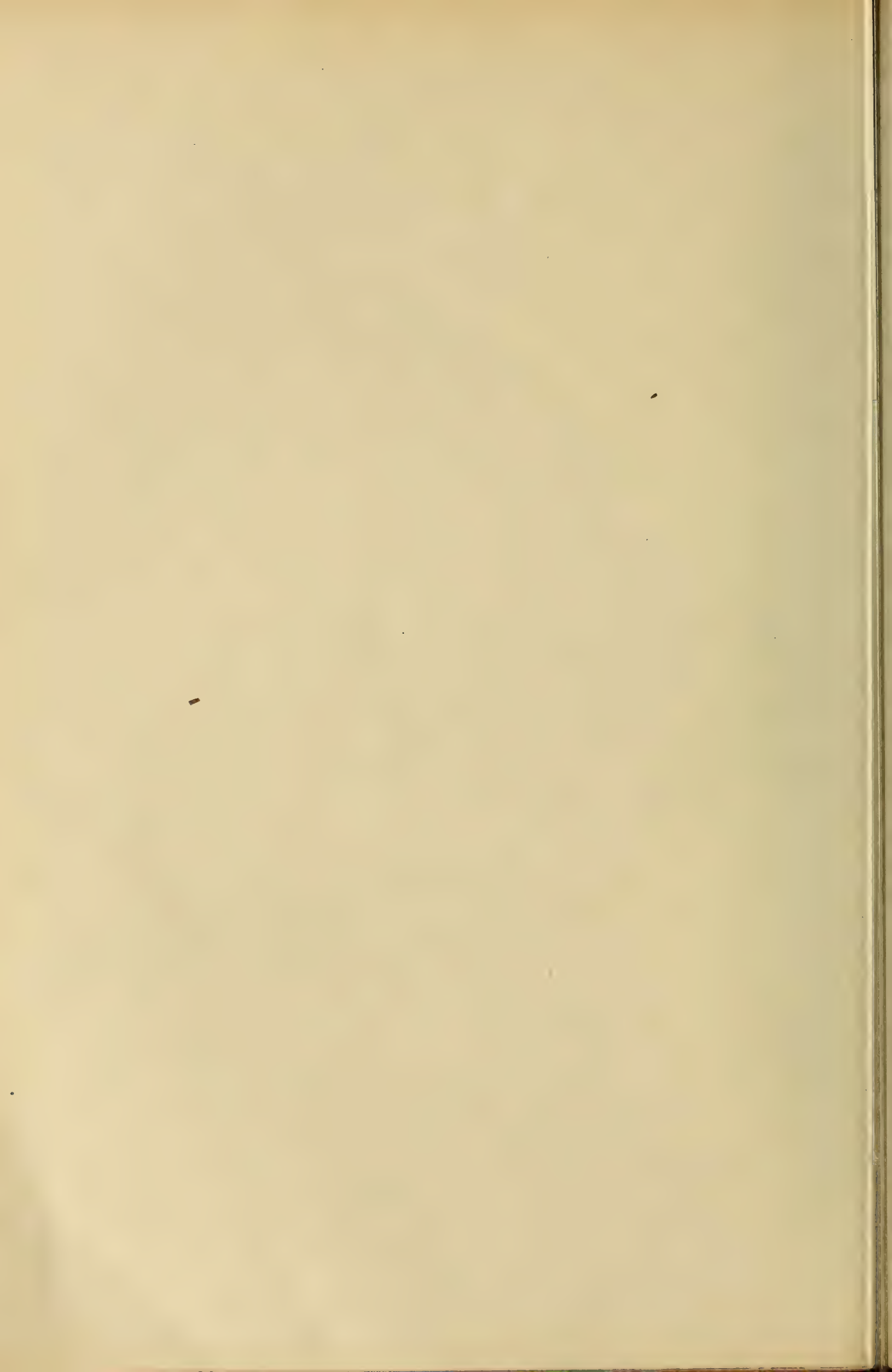
Dr. Ridgway says of the Palm Warbler, "During the spring migration this is one of the most abundant of the warblers," in Illinois, "and for a brief season may be seen along the fences, or the borders of fields, usually near the ground, walking in a graceful, gliding manner, the body tilting and the tail oscillating at each step. For this reason it is sometimes, and not inappropriately called Wag-Tail Warbler." The observer is reminded of the titlarks as he watches the nervous activity of this Warbler as it constantly jerks its tail while it flutters about the hedges and scattered shrubbery, or when running on the ground among the weeds of old fields. It may even frequent dusty roadsides. Wherever it is, it frequently utters its low "tsip," a note that is very similar to that of many of its sister warblers.

Dr. Brewer says, "They have no other song than a few simple and feeble notes, so thin and weak that they might almost be mistaken for the sound made by the common grasshopper."

The Palm Warbler's nest is a trim structure, usually placed upon the ground and never far above it. The walls consist of interwoven dry grasses, stems of the smaller herbaceous plants, bark fibres and various mosses. It is lined with very fine grasses, vegetable down and feathers. Though this home is placed in quite open places, a retired spot is usually selected. Here are laid the white or buffy white eggs, more or less distinctly marked with a brownish color, and a family of four or five of these peculiar Warblers is raised.



PALM WARBLER.
(*Dendroica palmarum*).
Life-size.



OLD-FASHIONED OUTINGS.

PART II.

While in our camp on the shore of Gloucester harbor, many were our adventures first and last, some of our own choosing, some not. In the mouth of Rafe's Chasm is a big oblong seamed rock, considerably lower than either wall at that point, with perpendicular sides and top slanting to the lower wall, which is the west, and the natural approach. At low tide the boys made a point of leaping the western channel and climbing up across the narrower eastern one, and where the boys went, the younger girls expected to follow. (How was it, I wonder, that girls began to be "tom-boys" just then? They have kept it up ever since, but it is no longer a matter of reproach.) The first girl who did this held the championship for some time, but the smaller ones qualified in the end. We were there one day at half tide when a good deal of surf was running, so we established ourselves well up on the rocks, but our Newfoundland dog elected to go down and enter the water at the western corner of the chasm. He was immediately swept out, and out started somebody's eyes! "You've lost your dog!" But even as we gazed in consternation, the wave—walked back and returned him! A strange sight it was—that black dog advancing as in a vehicle, standing unconcernedly in a tall green wave and, when it arrived, walking calmly out and shaking himself! No suction, no struggle, his feet just on a level with the flat ledge; out he walked and was hugged, dripping, as soon as we could lay hold of him.

The Magnolia Swamp stretches far toward Essex and Manchester, and with the surrounding heath and forest forms a wilderness which a wild animal might range for miles, crossing now and then a lonely road; and in the summer of 1884 two of us saw a very odd wild ani-

mal in the old road. Descending suddenly from the hill above, we saw a dingy white creature jogging slowly along in the middle of the road a short stone's throw ahead. It was clumsily made, and its gait was awkward and lumbering. It had short legs, very round hind-quarters, no perceptible tail, and long, slightly wavy white hair, exactly the same all over, without mark, spot or difference. We mended our pace and gained on it, when the creature did the same without looking round and plunged into a dense cover of brier with the heavy rolling gait of an elephant and at such an angle that we never saw its head, nor could we trace its line of retreat in the underbrush.

Now what was that? Please don't say poodle or woodchuck or skunk or raccoon. It bore no resemblance to either, except, in size and color, to the poodle. The only thing I ever saw at all like it was a stuffed lynx in a New Hampshire town. In color, length of hair, and absence of tail they were exactly alike. The stuffed specimen was twice as big as the live animal and long-limbed in proportion, while the latter was thick-set and clumsy like a cub.

One September day at sunset I was sitting on a low rock platform trying to paint a great green wave which reappeared at regular intervals, gathering under the rock with a growl and falling on the shore like lead. (The effort looked like a tin wave, and an artist said it should not have been attempted. The opposite headland was better, fresh from one ducking and expecting another from the pale green border surging up out of the gray, away from the eye.) At last the sole companionship of this sulky wave became oppressive, and turning landward, I looked up into an uncanny sky—a wild red afterglow barring the slate with flame-color—and smelt a

skunk, and felt far from home. And there on the top of the ridge, the highest point in that great amphitheater of wooded hills, the only habitation in sight, it stood out black against those flaming bars, amid the silhouettes of dying pines.

The dog would have been a support, but he wasn't there. After some experience of sketching-parties, he had given up attending. Collies are particular, and this one hated to sit with the wind in his face. When we first had him, he dogged every footstep for fear of being left behind, but at this stage of his development he would not stir a step with sketching material or a gardening hat; he knew too well that such accessories led to nothing. Yet his polished behavior in other respects had so impressed a small visitor in long Greenaway robe and cap, that when she made her series of curtsies to the family semicircle on leaving, she curtsied with equal gravity to the dog as he lay chin to the floor, half under the table. And that was quite right. Doubtless we all bow to persons far less deserving than this forgiving dog who always hastened to console you when you trod on him.

However, on this occasion I had to get home alone and dodge skunks unsupported under that awesome sky. The best part of a mile away and all the way up-hill, the last pitch abominably steep and rough, the choice of site would have done credit to a robber baron, but the land falls away gently to the Manchester road on the other side. It took months with a derrick and oxen to forge the connecting link, however; and one section, which rounds a hill and crosses a gully, looked like the bed of a mountain torrent for weeks. The camp of 1865 led to the choice of 1883, as many a camp has done from Roman days on. The Pequot war settled central Massachusetts as the Revolution filled up New Hampshire and Vermont. It was not so much that the land stood empty as that men went out and saw the land, that it was good. Behold a by-product of war.

If the merry greenwood was as our native heath, so too was the water. It was about a third of a mile off the Rock that he of the rifle once had a difference

with a shark. He was out alone in a dory when the shark happened along and thought, being there, he might as well see if he couldn't upset the boat. So he came swarming up on the oar until the youth got tired of it, and standing up, balanced himself not to overreach in case the shark proved slippery and thrust the butt as hard as he dared between the eyes, which were about a foot apart. But the shark was not slippery. He felt rough, and as hard and solid as a ledge, while the youth felt as if he had hit that same. However, his Honor seems not to have enjoyed it either, for he soon settled in the water, and circling lower and lower two or three times, disappeared.

Some years before that, this boy was out with another when the harbor was full of herring, and a whale appeared which had followed the schools in. And he popped up so frequently and blew in such unexpected places that the boys deemed it best to make for the nearest land. Meantime the whale rose in their wake with his jaws wide open in the middle of a school of herring, and they saw a lot of the fish flipping dry in his throat; and the boat came in and all the passengers stood on deck looking at him, and then he got excited and ran around, the tide being low, on some shoals in behind the Island, and thrashed about so, they thought he must have hurt himself. It was a thrilling afternoon.

The dory is a proved little craft for serious business in rough water, while none can be better for ladies about rocks and beaches; because it has a flat bottom and there is no keel to catch and leave you tipping about with the lap of the water running ever so far inside. Moreover, the dory has so much shear that very little of the bottom touches at one time; and if it hangs anywhere, you can take it by the nose and work it off quite easily. We fully appreciated the merits of a build which permitted crossing the harbor in good gowns to make a call we did not wish to spend a whole evening on, landing perhaps on a lonely bit of shingle with a sharp little sea thrashing in, "firing" all along the tops of the waves. We often went out to

supper in dories, taking a small charcoal furnace, a griddle and a pitcher of batter, and rowing down to some great flat sheets of rock made for the purpose on the Point. There we pulled up the boats, set up housekeeping and fried our flapjacks, first waiting to enjoy the sunset over the western shore reflected in the harbor. (If you stay in the house the sun always sets while you are at supper, if you notice; and this is nature's revenge on you for eating indoors instead of out-of-doors, like Christians.) Then we rowed home by moonlight or perhaps by starlight, pausing to amuse ourselves by stamping on the bottom of the boat, startling the fish under us and making them dart, leaving a phosphorescent wake far below.

If a thunder-shower surprised us, we rolled the boats over and crept under, the valued shear allowed plenty of air. It is true, if the shower lasted too long, the water was apt to run down the rock and leave somebody in a puddle, while it might become painful to take too perfect an impression of the pattern of the rock on one elbow, but it's worth getting wet to cross the harbor in the rain with the drops hissing in the water and turning to pale fire wherever they strike.

The dory is a stiff little craft, too, not easily upset, as some of our party proved at the beach one day. Half-a-dozen of them embarked in bathing dresses and when beyond their depth stood up on the seats and rocked with all their might; but this not effecting their purpose, the girls jumped out and the two or three men left danced on the gunwale and finally overturned it.

One starlight evening two of us, escaping from the heat in town, were floating close inshore somewhere down near Black Bess, when suddenly out of the darkness arose the sound of a sailboat bearing down on us full tilt. We sprang up in dismay, though it was dead calm

and we knew no boat could come where we were. We peered into the darkness, but nothing came and the sound died as it sprung into being, full grown, without crescendo and without diminuendo. There was no splashing, either; just the full, steady rip of the cutwater at speed. It lasted perhaps a minute, and was a startling affair. Experienced persons say they never heard anything like it, and suggest sharks. People always suggest that—what can you expect after Lyell said shark to our family pet, "the sea-serpent," which our own grandparents saw in 1817 from such a coign of vantage that if it had been a shark, one would think they would have known it. We all know the place where they were driving "along the edge of a cliff—when he saw the sea-serpent at the base—on the white beach where there was not more than six or seven feet of water; and giving the reins to his wife, looked down upon the creature, and made up his mind that it was ninety feet long. He then took his wife to the spot, and she said it was as long as their wharf, and this measured one hundred feet. While they were looking down on it, the creature appeared to be alarmed, and started off." (Lyell's Diary.) This is an incredulous world.

Does anyone ever read "The Toilers of the Sea" nowadays, or remember the finale? Having purposely allowed the tide to catch him, the hero sits in a niche in the cliff awaiting death, with his eye on the ship which bears away his beloved, who has married the wrong man. And as the ship drops behind the horizon, the water covers his eyes—when we read that, with one accord we made for the beach, and as soon as the tide served round a big ledge, we practiced that scene, and found it unimpressive. As we expected, you float off: you can't stay there! and we thought Victor Hugo should really have practiced it himself.

HELEN MANSFIELD.

OUR KINSMAN.

Alive in this world of beautiful forms,
No form is alien to men, or apart,
Each morning sunbeam our being warms,
Each tree is a kinsman of friendly heart.

We love the clear bird songs that fill our ear
With melody ringing for us alone.
The cricket's chirp is for us, and we hear
A human voice in the rivulet's tone.

Each lovely thing of nature finds room.
In our heart of hearts—our lover and mate,
The star and the dew and the vine's sweet bloom
Are fitted to us, and our spirit innate.

They are kinsmen—each century blazing star!
Each snowclad summit, each rose-flushed peak
Have most subtle oneness with us, for afar
Of things sublime and eternal they speak.

With all beautiful things that live, we are one.
We are kin to the circle of nature's whole.
So, O beautiful trees that stand in the sun,
Your beauty entrancing slips into the soul.

For the children of one great Kinsman above
Are the myriad forms of nature and we.
Kinsman, Creator, He fits our love
To the star and the flower, the bird and the tree.

—MRS. MERRILL E. GATES.





THE LONG-BILLED CURLEW.

(*Numenius longirostris*.)

Each day are heard, and almost every hour,
New notes to swell the music of the groves,
And soon the latest of the feathered train
At evening twilight come;—the lonely snipe,
O'er marshy fields, high in the dusky air,
Invisible, but, with faint, tremulous tones,
Hovering or playing o'er the listener's head.

—CARLOS WILCOX, "The Age of Benevolence."

The Long-billed Curlew is the largest of the American curlews and has a wide range covering nearly the whole of temperate North America. It is not a bird of high altitudes and in winter it seeks the milder climate of the Southern States, Mexico, Guatemala, Cuba and Jamaica. During the breeding season, which is passed in the South Atlantic States or in the interior of North America as far north as Manitoba, it is not a social bird. While migrating, however, and in winter, it enjoys the society of its fellows and is generally observed in flocks of a greater or less number.

Mr. Wilson has well described its flight during migration or when passing from one feeding ground to another. He says, "The Curlews fly high, generally in a wedge-like form, somewhat resembling certain ducks, occasionally uttering their loud, whistling note, by a dexterous imitation of which a whole flock may sometimes be enticed within gunshot, while the cries of the wounded are sure to detain them until the gunner has made repeated shots and great havoc among them."

Though the natural home of the curlews is the muddy shores and grassy lowlands adjacent to bodies of water the Long-billed species also frequents drier places at a distance from water, and even breeds in the uplands. Here their food consists of worms, insects and berries. When fattened with such food their flesh is tender and lacks the stronger flavor that is present when they have fed exclusively on the animal food of the marshes of the sea shore. It is interesting to watch the Curlew upon the beach as it gracefully moves from point to point in search of food. Now and then it thrusts its long sensitive bill into the

soft soil and usually draws forth some form of animal food—a larva of some insect, a crab, a snail or a worm. Frequently it will explore the holes of crawfish and it is often rewarded with a dainty morsel of curlew food.

The Curlew's bill is very characteristic and especially adapted to the bird's habit of probing for food. It is very variable in length and not infrequently grows to a length of seven or eight inches, and it has been known to reach a length of nearly nine inches. The upper mandible is somewhat longer than the under and is provided with a knob at the tip. The bill is much curved, a characteristic which has given the bird the names Sickle-bill and Sickle-billed Curlew or Snipe. It was the curved bill that suggested to Linnaeus the generic name *Numenius* for the curlews. It is a Greek word meaning the new moon. The long bill also suggested to Wilson the specific name *longirostris* or long-snouted.

Dr. Coues says, "Its voice is sonorous and not at all musical. During the breeding season, in particular, its harsh cries of alarm resound when the safety of its nest or young is threatened."

The Long-billed Curlew spends but little time in home building. Its nest consists of a layer of grass placed in any suitable saucer shaped hollow on the ground.

The downy young resemble the adult bird but little. In color they are a pale brownish yellow modified by a trace of sulphur yellow, the under parts being somewhat darker. The upper parts are irregularly mottled with coarse black spots. At this period in the life of this Curlew, the bill is straight and about one and one-half inches in length.

ON JEWELLED WINGS.

There are few or none who fail to delight in the beauty of the butterfly, while to the thinker its different stages of existence are rich with lessons in which the analogy-loving soul of man can revel to fullest gratification. Flitting about above the things of earth it seems to descend for rest only, or to sip the sweets of some nectar-bearing flower. In the sunshine all day long, chasing at will through field or woodland, and with no more care than the so-called "butterflies of fashion" (not as much, for it needs to give no thought to the fashion or fit of its garb), it basks till nightfall in the delights that go to make up its ethereal existence.

But whenever we thus watch the brilliant little creature we should remember that it has come up through many changes and tribulations to this its last and perfect stage. Weeks, months, or—as in the case of one or two species—three years before, a tiny egg was deposited in some safe, secluded spot, the parent butterflies dying soon after because of their mission being then accomplished.

The egg is the first stage of the butterfly, as it is also of the moth. The eggs of the different species vary greatly in size and shape, and are deposited in as many different kinds of places. Some are placed on the under side of leaves, others on the outside of the cocoon; some are glued together in rings around the smaller branches of fruit trees, others on the interior of beehives. In this stage they remain for periods varying from a few weeks to three years, when the larva or caterpillar state is entered upon. The larvæ are very greedy, beginning to eat as soon as hatched and devouring the leaves, spreading themselves over the web prepared for them by the parent, ravaging the fruit trees, or routing the bees from their rightful possessions. A number of changes of skin take place during the

larval stage, ranging from five to ten. Some are smooth-skinned and are used by insectivorous animals for food, while others are hairy and on this account are rejected as food, the hair having the power of stinging much the same as nettles.

Having attained its full growth the instincts of the caterpillar undergo a change. It ceases to eat and begins to weave a couch or cocoon round about itself by which it is finally more or less enclosed. It then throws off the caterpillar or larval skin and appears in the third stage.

This state of its existence seems to me the most mysterious and therefore the most interesting. More than one of these cocoons have I found attached to walls, fences, limbs and in similar places, looking as though they were but the dried-up remains of some species of insect life. But there was life within them, a germ which sooner or later would spring forth in all the wonderful beauty of the moth or the butterfly.

This third period is termed the pupa, nymph or chrysalis state. Its duration varies from a few weeks to several months, according to the time of year at which it enters this stage. The common Cabbage Butterfly, which rears two broods during the season, is quickest to make the change, only a few weeks of the pupa form being necessary. Some remain in the chrysalis a month or more, appearing in the butterfly form at the close of the summer. Those becoming encased in autumn are like the hibernating animals in many respects, lying dormant the winter through. The only sign of life ever discovered in the pupa is a convulsive twitching when irritated, and for this reason those who know nothing of the hidden beauties of butterfly life miss a great deal of pleasure in not being able to study the seemingly lifeless chrysalis.

When mature the pupa case cracks

toward the anterior end, and the butterfly or moth crawls forth with wings which, though at first small and crumpled up, in a few hours attain their full size. As soon as they are strong enough the new creature mounts upon them and, if it be a butterfly, flies out into the sunlight; while the moth hies away to some dark corner until nightfall, then for the first time in its existence it rises upon wings to enjoy the summer zephyrs.

I remember having watched one butterfly leave the chrysalis and, though but a child at the time, I shall never outlive the impressions which that rare pleasure left with me. It was one of the large-winged, black-white-and-yellow fellows which every one admires so much, and which species is regarded as a treasure here in these Central States. Little by little the ugly casing opened, and when I first saw the baby butterfly he was like a tiny mass of mingled colors, with neither life nor shape to give me an idea of the sort of creature into which he would develop. Soon he began to move uneasily, like a child awaking out of a long sleep; then he stretched his wings leisurely as though proud to have found them at last. Next he drew himself up and finished bursting his paper-like shell, gained a foothold on the plank on which we had placed him and looked about with a, seemingly, very much surprised though gratified air. Meanwhile he kept working his wings and stretching them anon, very impatient because of their, to him, slow growth.

At last he gained the confidence to try them, and within an hour from the time we first saw him he had arisen and flown away into the sunshine to seek his place in the world.

Butterflies and moths are widely distributed all over the globe, occurring, however, in greatest variety and abundance in tropical lands. They are found as far north as Spitzbergen, on the Alps to the height of 9,000 feet, and to double that height on the Andes. In Great Britain there are sixty-six species, while in all Europe only three hundred and ninety have been enumerated. In Brazil there are about seven hundred, and the total number of species of moths is about two thousand. Among the butterflies are to be found some exceedingly beautiful insects, some of them very large, especially in the tropical belt.

The butterflies are to insects what the humming-birds are to the feathered tribes, the analogy holding good not only in the brilliant colors and manner of flight, but also in the nature of their nutriment—the honeyed juices of flowers. Both seem destined to brighten and beautify the way for man, while the lesson of immortality gathered from the life of the ethereal butterfly, like that conveyed by the beautiful and ever-wandering Psyche of Greek mythology, is so easy of comprehension that we can but stop and wonder at the exquisite simplicity with which the all-wise Creator has clothed so important a truth.

CLAUDIA MAY FERRIN.

Oh! the bonny, bonny dell, whaur the primroses won,
Luikin' oot o' their leaves like wee sons o' the sun;
Whaur the wild roses hing like flickers o' flame,
And fa' at the touch wi' a dainty shame;
Whaur the bee swings ower the white clovery sod,
And the butterfly flits like a stray thought o' God.

—MACDONALD.

THE EVERGLADE KITE.

(*Rostrhamus sociabilis*)

High in mid-air the sailing hawk is pois'd.

—ISAAC MCLELLAN, "Nature's Invitation."

The Everglade Kite or Snail Hawk, as it is sometimes called, has a very small range within the borders of the United States, where it is limited to the swamps and marshes of Southern Florida. It also frequents Eastern Mexico, Central America, Cuba and the eastern portion of South America as far southward as the Argentine Republic.

Its habits are very interesting. Peaceable and sociable at all times, other birds do not fear them. "The name of the Sociable Marsh Hawk is very appropriate, for they invariably live in flocks of from twenty to a hundred individuals and migrate and even breed in company. In Buenos Ayres they appear in September and resort to marshes and streams abounding in large water snails, on which they feed exclusively." They spend much of the time flying, and when soaring will frequently remain poised in the air for a considerable time without apparent motion, except that the tail is constantly and nervously moved in nearly every direction.

An authority, writing of these birds in Florida, says, "Their favorite nesting sites are swamps overgrown with low willow bushes, the nests usually being placed about four feet from the ground. They frequent the borders of open ponds and feed their young entirely on snails. According to my observations the female does not assist in the building of the nest. I have watched these birds for hours.

She sits in the immediate vicinity of the nest and watches while the male builds it. The male will bring a few twigs and alternate this work at the same time by supplying his mate with snails, until the structure is completed. They feed and care for their young longer than any other birds I know of, until you can scarcely distinguish them from the adults."

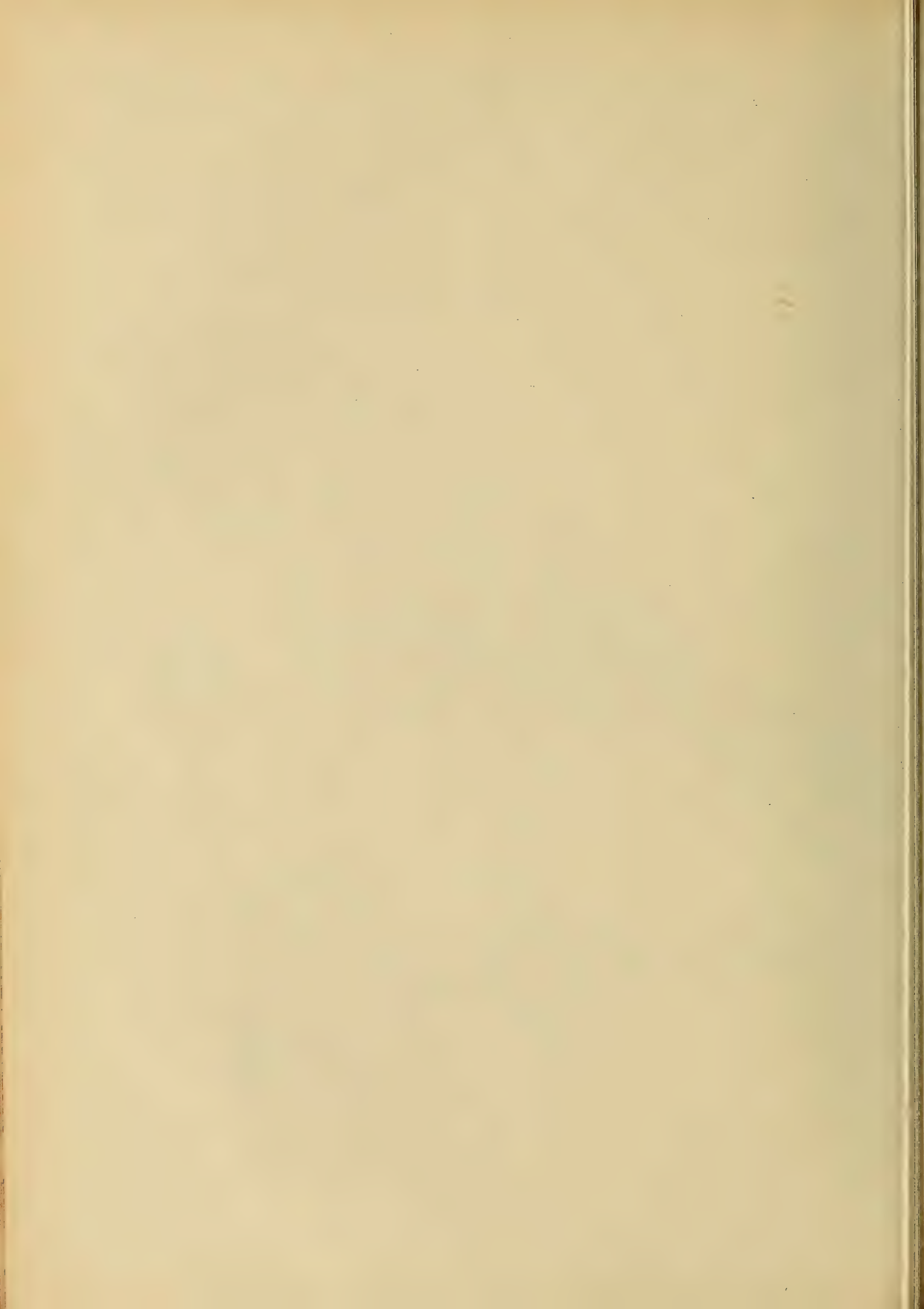
The nest is a flat structure, the cavity being rarely more than two or three inches in depth, and the whole structure is about twelve or sixteen inches in diameter and about one-half as high. It is usually placed in low shrubs or fastened to the rank growth of saw grass sufficiently low to be secure from observation. The materials used in its construction are generally dry twigs and sticks loosely woven together. The cavity may be bare or lined with small vines, leaves or dry saw grass.

Dr. A. K. Fisher says, "Its food, as far as known, consists exclusively of fresh-water univalve mollusks, which it finds among the water plants at the edges of shallow lakes and rivers or the overflowed portions of the everglades. When the bird has captured one of these mollusks it flies to the nearest perch and removes the meat from the shell with apparent ease and without injuring the latter. While collecting food it will often secure five or six before returning to the nest, keeping in its gullet the parts it has extracted for the young."



EVERGLADE KITE.
(*Rostrhamus sociabilis*).
2 5 Life-size.

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THE ANIMALS' FAIR.

PART I.

Once upon a time—for this is a fairy story—all the beasts and birds and bugs gathered in a solemn convention. The object of their meeting was explained by the dog, who—because of his intelligence and his intimacy with men and their ways—had been elected chairman of the convention.

He spoke thus:

"My friends, we have gathered here to discuss an important question, namely, 'Our dealings with men, and men's dealings with us.' It is a sad fact that although we are the benefactors of mankind, and positively necessary to their well-being and even to their lives, they do not appreciate us as they should. If you will pardon my egotism, I will illustrate this assertion by my own experience. I may say modestly—for I am only quoting men's words—that I am considered the most intelligent of beasts, and am chosen as the companion, the playmate, the assistant, yea, the protector of man. I cheer hours of his loneliness from the cradle to the grave, and am ever ready to assist him in a thousand different ways. Yet how am I treated? A hard crust, a dry bone, kicks and curses and harsh words, a bed on a hard plank or on the cold ground, wherever I can find it. These are too often the inventory of my rewards; while the torments inflicted by small boys, and the indignity and torture of tin cans tied to my tail, fill the full record of my tale of woe. No doubt the rest of you have grievances many and various.

"We will be pleased to hear from any of you who desire to speak, and will be glad of any suggestion, or plan for the general good which may present itself to you. The meeting is now open for remarks."

He sat down on his tail and assumed his most dignified and intelligent expression, while he looked about the miscellaneous assembly. In an instant the horse

walked forward, and was duly recognized by the chairman.

"The words of our chairman have struck a responsive chord in my heart," he said gravely. "I have pondered on this subject many times when suffering from the abuse of men. Sometimes I am driven at my utmost speed for hours at a time, while my head is held unnaturally high and my graceful neck cramped and stiffened by the cruel check-rein; my body exposed to the torments of flies because my beautiful tail has been docked; and then, when weary and sore and overheated, I am tied up in some chilling draught of wind while my feet are obliged to stand in a wet gutter, and I am stiffened and ruined for life by some person's ignorance or foolishness.

"It does seem a pity, to me, that some more rational creature than man had not been chosen as 'The lord of creation' in the beginning. Why, he cannot govern himself. Then how can he be capable of governing us who follow unerring instincts with unfailing faithfulness? The question is wide as the world and deep as the sea. As I have said, I have pondered it many times in all its aspects, but as yet have reached no definite conclusion which might suggest a remedy.

"Therefore, let me urge upon you all to give us your wisest thoughts upon this subject, which is of vital importance to us all."

He returned to his place and waited anxiously for the next speaker.

The cat took the floor with a graceful step and a gentle expression which caught the favor of the assembly.

"I am small among beasts, but my grievances are many and great. I am chosen by men as a playmate for their children, so that the mothers may be free to attend to what they call their 'necessary work' in peace and without interruption. How am I rewarded?

"The children whom I strive to amuse drag me ceaselessly around, pull my tail and pinch my ears, blow in my face and jerk my sensitive whiskers; and if I remonstrate with voice or teeth or claws, I am beaten and kicked and tossed out of doors without even the privilege of trial by jury.

"I catch the rats and mice which infest men's houses, and then when they forget to give me milk which is so necessary to prevent the ill effects which follow a diet of meat and I help myself delicately to a few laps of cream, I am abused as if I had committed a mighty and unpardonable sin.

"They call me a necessity, yet they drown my beautiful kittens, or carry them off in bags and cast them helpless and forlorn upon the mercy of a cold and cruel world. And then men presume to say that they are made after the image of God, and have been divinely appointed masters of the world! What blasphemy! What blind stupidity! Words fail me in view of these appalling facts."

Half the assembly was in tears before poor pussy had finished her category of woes.

A fly buzzed forward with impulsive haste, and spoke with a little rasping voice:

"We flies are small, but we are mighty. We remove mountains of dirt for uncleanly men, and how do they reward us? They catch us in traps and drown us with boiling water. They snare our feet with treacherous fly-papers, and after laughing at our struggles to get free, burn us without mercy. Small boys torture us with pins, or pull off legs and wings for what they call 'fun.' If they do not want us about them, why do they make the filth which necessitates our presence? That is a conundrum beyond my solving. I leave it for this wise assembly to answer."

The fly buzzed back to a sunny spot, and an unwieldy hog ambled forward.

"As greedy as a hog," "As lazy as a pig," "As fat as a pig," "No more sense than a hog." Have you never heard such expressions as these fall from the lips of men? They shut us up in little dirty pens where we must needs be lazy, since we cannot run about. They continually tempt us with food, and the more we eat

the better they like it, since it produces the fat which they afterwards deride. If we weary of dry corn or thin slop, and break through some convenient hole which their own carelessness has left, and help ourselves to the tender cabbages and peas of their gardens, they chase us with yells and sticks and stones, and send their dogs to make devilled ham of us before we are dead."

His pun so amused the assembly that they were convulsed with laughter. After vainly waiting several minutes for silence the hog returned calmly to his place, convinced that he had at least presented his grievances in a striking manner.

A handsome black Spanish rooster strutted forward to the platform, and stretching his neck, called the audience to order with his clear-toned

"How-do-you-do? I am the 'Cock-o'-the-walk,'" he explained, "a term which men are pleased to borrow and apply to themselves. They rely upon me to give them warning of the approach of day, and then grumble because I disturb their slumbers. How can they expect to wake up without having their slumbers disturbed? That's what I would like to know. They rely upon me to eat the worms and bugs and grasshoppers that destroy their gardens, and then chase me with stones and dogs when they find me in their gardens doing my duty.

"They pen me up, often for days at a time, with insufficient food and water, and do not even deign an apology for their neglect.

"My wives supply numerous eggs for men's food, yet they wring our necks without mercy if we venture to eat an egg ourselves when they have forgotten to feed us. 'As full as an egg is of meat,' is a comparison which might properly be balanced with 'As full as a man is of inconsistency.'

"If men would attend to their business and scratch for a living as I do, the world would be a far better place than it is today."

He ended amid prolonged applause, and walked proudly to a conspicuous perch in the sunshine.

By this time there was much excitement among the audience, who all signified a desire to speak at once. While the

chairman was busy quieting them with most vigorous barks, a monkey with much agility made his way over the heads of the audience, and leaped to the platform, where he was ready to make his profoundest bows to the assembly the moment quiet reigned.

"You may consider me an alien, since I hail from a far country, yet I am truly American—for even South America reveres the Stars and Stripes," he said, and his words were applauded by the very ones who had but a moment previous frowned at his audacity.

"I hold myself the superior of mankind since many of their scientists assert that the human race are but highly developed monkeys. To be sure, a few haughty fellows have lately declared that monkeys are but the offspring of degenerate men, but we monkeys resent such assertions as uncalled-for insults. Why, it is bad enough to have to endure the thought that possibly—mind you, I say possibly, not probably—possibly men have descended from our race. There is no monkey but what lives up to the best of his God-given instincts, whereas, on the other hand, there is no man that does at all times the very best that he knows. Therefore, by all the rules of logic, the monkey is superior to the man, and must be thus considered by all fair-minded judges.

"This, however, is but a prologue to my more serious remarks. I have only been presenting my credentials to this court.

"May I now proceed to disclose my plan for calling the attention of ungrateful men to the benefactions we are daily bestowing upon them?" He paused and bowed respectfully to the chairman and then to the audience.

A thunder of applause greeted his proposition, and the hall resounded with cries of "Good! good!" "Go on!" "Three cheers for Brother Monkey."

When quiet was restored, the monkey continued rapidly:

"Since my time is necessarily spent in intimate association with men, I have taken note of many of their schemes for self-aggrandizement. The most popular at the present time, is the Fair, where everyone seeks to outdo his neighbor and to proclaim his own superiority to the whole world, while he exhibits his own abilities and his own genius by a display of his productions.

"Now, what I propose is this: Let us secure a convenient enclosure, and let each family of birds and beasts and reptiles erect a booth in which to display the gifts which they are daily bestowing upon mankind. Perhaps in this way the hearts of men will be drawn to honor us, and they will—after the ruling passion of men—seek to advance their own interests by favoring ours. Does my plan meet with approval? If so, your humble servant feels highly honored." He placed his hand upon his heart and bowed deeply to his audience, then, with customary dexterity, returned to his place as he had come, while the hall resounded with prolonged applause.

The meeting was at once declared a "Committee of the Whole," and vigorous plans were laid for the carrying out of the monkey's scheme.

Because of his familiarity with such places of resort, the monkey was elected President of the Fair, an office which he accepted with many expressions of humility, and equally numerous feelings of self-complacency.

Other officers and directors were speedily appointed, the place for holding the Fair selected, and the time set. Being unacquainted with the red tape and appropriation-grabbing customs of men, the animals thus speedily brought their business affairs to the working point, and in the utmost harmony adjourned to begin their preparations without delay.

MARY McCRAE CULTER.

THE BIRD AND THE MOUSE.

Belonging to our household was a tiny creature, Nixie, who from his gilded cage between the lace curtains observed and commented on all our actions. His door was left open occasionally, and his gregariousness moved him to go where he could take part in conversations and see people. He desired company even at his bath; he had never heard of fear, and won our hearts by his perfect trust. Morning and evening we gave him first salutation, and allowed him to pick our fingers by way of shaking hands. Messages came to him from over sea; gifts fell to him at Christmas; in all our life he had a part. And even the mouse made its bow.

Our hearts had been softened toward the "wee, cow'rin, timrous beasties" by a tender little tale of a parsonage mouse, and we made friends with a gray visitor that showed itself, now in the den at the back of our house, now in the sitting room in front. Because we took our meals out, Monsieur Mousie's crumbs were uncertain; but he investigated thoroughly and managed to find a livelihood. In our quiet rooms we often heard him at his hunting, and smiled at thought of his daring and industry. Twice he was emptied out of the carpet-sweeper (he must have fallen on very hard times at those periods), but seemed none the worse for the adventure, although the manipulator of the sweeper was herself much disturbed. The waste paper basket finally became his cupboard, and peanut shells his favorite fare. Often as we sat, my brother smoking and I reading, we would hear bits of paper rustling and would know bright eyes were watching us while sharp teeth nibbled the husks we had saved for them. Daily, for a month or two, the small thing came for his share.

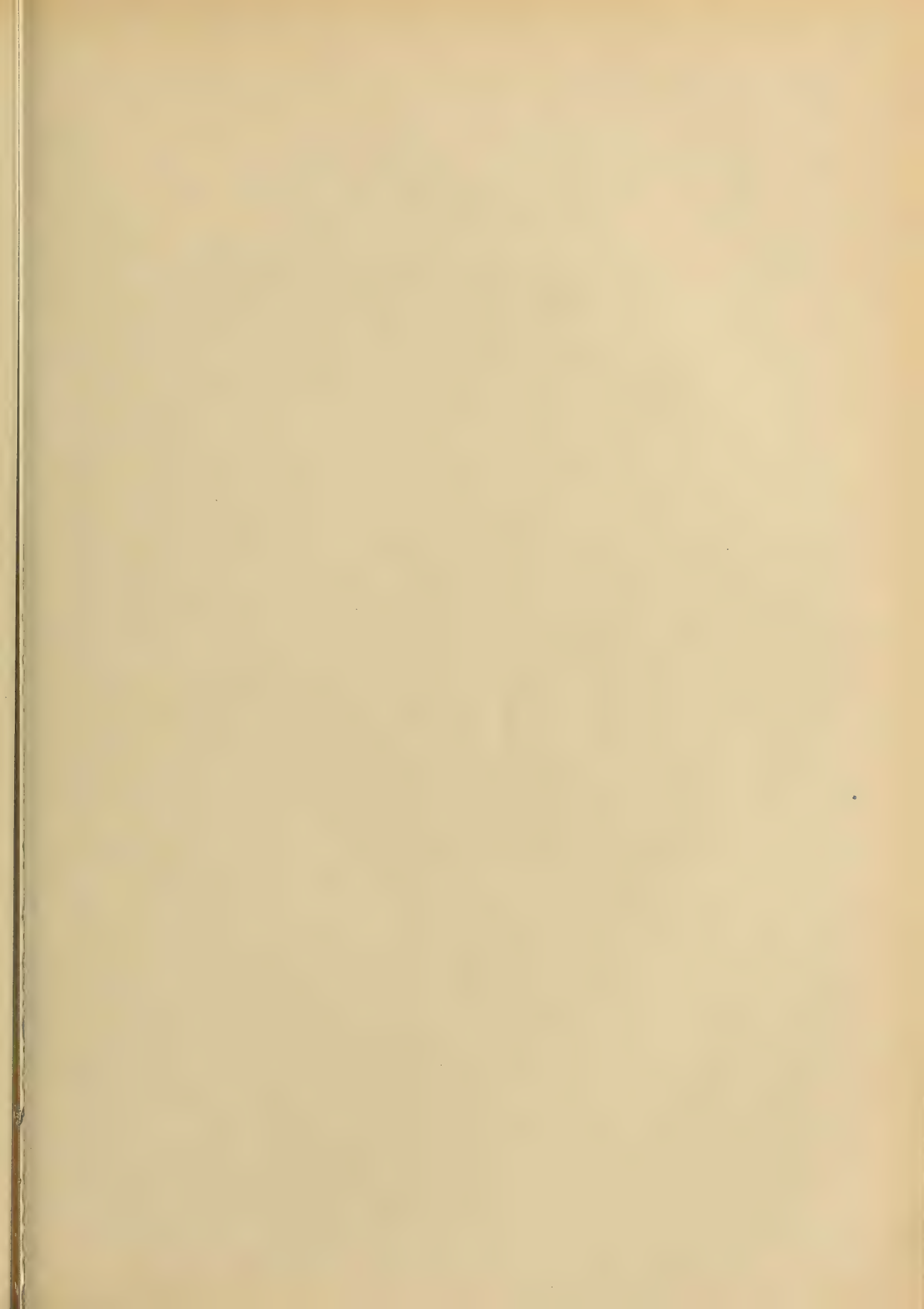
Alone in the room one Sunday evening, I was lying on the couch reading when I saw a little gray shadow steal out and creep toward the waste paper basket. I knew there was nothing in it, and lazily felt for Mousie's disappointment. The

gray shadow stole back, halted by the lace curtains, floated up them half way, and stopped near Nixie's cage. I held my breath. What next? Was he after bird seed? Was this the explanation of Nixie's empty cup that had perplexed me the last week? But a peculiar, quick chirp made me wonder if the bird were afraid, if the mouse could get at and hurt him. I raised my head and saw the gray thing sitting on the seed cup eating like one starved. Nixie was looking at it, his wings wide spread, eyes flashing, mouth wide open in protest, body poised for attack. But the feast went quietly on. Nixie gave a few sharp questions and then settled down to study his visitor.

It was too good to keep to myself; I called my mother and brother and whistled up the tube for neighbors to join us in watching the strange scene. By the time the audience was gathered the actors were ready to play their parts. Nixie went close to the seed dish and chirped a welcome to his guest, then, hopping backward, selected a station and sang a sweet song for him. The mouse seemed to like it. He left off his eating and crept along outside the floor of the cage, which extended a couple of inches from the bars. Nixie within and Mousie without promenaded together around the four sides; and close together, too, Nixie all the time gayly gossiping and chattering. We say they kept it up for half an hour, but that is a pretty long time. At any rate it was several minutes.

How the acquaintance might have ended I cannot say. The next day the curtains were taken down and Mousie, sadly disappointed, had no ladder by which to climb. And later in the week Nixie went out of town for the summer. We wanted to take the mouse, too, but the noise the packers and movers made probably frightened him to such an extent that he dared not show himself. We do not know what his future was, but we trust it was crowned with the success due pluck and gentleness.

KATHARINE POPE.





THE GRASSHOPPER SPARROW.

(*Ammodramus savannarum passerinus.*)

Of all the bird voices of the meadow, for its interesting originality and its effect in ensemble, we can least spare that of the little Grasshopper Sparrow.—R. M. SILLOWAY, in "Sketches of Some Common Birds."

This little bird of the meadow and hayfield is quite easily identified by the marked yellow color at the shoulders of the wings, the yellowish color of the lesser wing coverts, the buff colored breast and the orange colored line before the eyes. Its home is on the ground, where its retiring habits lead it to seek the protecting cover of tall grass and other herbage. As it is not often seen except when flushed or when it rises to the rail of a fence or to the top of a tall spear of grass to utter its peculiar song, it is often considered rare. It is, however, a common bird in many localities of its range, which covers the whole of eastern North America, where it builds, upon the ground, its nest of grass lined with hair and a few feathers. It nests as far north as Massachusetts and Minnesota and winters in the southern states and the adjacent islands.

This bird was given the name Grasshopper Sparrow from the fancied resemblance of its weak cherup—"a peculiar monotonous song"—to the shrilling produced by the long-horned grasshopper. However, the song often begins and ends with a faint warble. Mr. Chapman says that these notes "may be written pit túck zee-e-e-e-e-e-e-e."

Mr. Silloway writes at length and enthusiastically of the Grasshopper Sparrow. He says, "To the sympathetic ear the voice of the humble Grasshopper Sparrow is as necessary to the harmony of the meadow overture as the clear piping of the meadow lark or the jingling triangle of the bobolink. The leading instruments of the orchestra usually receive our attention, yet the accompanying pieces are chiefly responsible for the resulting harmony. Taken alone, the notes of the minor parts are harsh and unme-

lodious, but sounded in time and accord with the cornet, the first violin, and the double bass, they assist in producing an effect delightful and harmonious. Thus it is with the voices of our little accompanist in the mottled brown coat. Heard alone at close station, it is seemingly shrill and unmusical; but in the midst of expanded verdure, following the lead of the meadow voices, its noonday crooning produces a dreamy harmony perfectly in accord with the thoughts of the listener."

The name of this little bird is not only appropriate because of its song but also on account of its food. In the examination of one hundred and seventy stomachs, Dr. Sylvester D. Judd found that the contents contained sixty-three per cent of animal matter, twenty-three per cent of which consisted of the remains of grasshoppers. His investigations covered a period of eight months. Thus during that period these insects formed nearly one-fourth of the total diet of the birds examined. He also discovered that during the month of June, the greatest number of grasshoppers was eaten and formed about sixty per cent of the stomach contents.

In rural districts it is seldom called a sparrow and is more commonly called Grass-bird, Ground-bird or Grasshopper-bird. Another appropriate name is Yellow-winged Sparrow. All these names well portray its habits and characteristics. Its flights are short and rapid, but "on the ground or in the grass it runs like meadow mice to elude the presence and notice of intruders."

The Grasshopper Sparrow is an adept in leading an intruder from the vicinity of its nest. The male seldom utters its song close by its brooding mate, and

either bird when disturbed in the vicinity of their home will skulk through the grass for some distance and, if necessity of refuge requires flight, will rise from a point sufficiently far away to mislead the intruder.

Both sexes bear the responsibilities of brooding and their home life seems to be one round of contentment. "Although

the male seeks to win the affections of his lady love by persistently shrilling near her the story of his passion he generally represses his love trills near the home which his mistress has established. * * * Cheer her he must, however, and so he trills throughout the day from fancied situations within her hearing, yet safely removed from the guarded spot."

A HAPPY FAMILY.

"Papa" is now the name of our college rooster, his hereditary name, however, having been the "Duke of Wellington," since he always claimed that he descended from renowned English stock. Be all that as it may, he is a handsome bird of portly proportions and of deep orange and golden plumage. He sports a superb mural crown and has brilliant eyes ever on the watch for the welfare of his numerous family of wives and children. Altogether he is a domestic hero and steps as proudly as ever Hector trod the plains of ancient Troy, while his clarion voice wakes the morning echoes for miles around.

Now, the reason why our big rooster is called Papa springs from quite a novel circumstance all his own and which has been for some time the town talk among the Four Hundred of our poultry social circles. The curious affair was strictly in this wise: Late last fall, or, to be more definite, about the middle of November, one of our little hens, "Biddy the Bantam," stole her nest, as old housewives would put it, in the adjoining thicket, and in the fullness of time brought off an even dozen as bright, cherry chicks as ever gladdened the heart of a mother partlet.

As soon as the chickens could nimbly walk the provident hen led them to the rear of the college kitchen to be properly fed.

Now it may suffice to enhance the in-

terest of our story and perhaps make several points more clearly understood by the casual reader to say, or rather to delicately intimate, sub rosa, of course, that Biddy the Bantam was not the real mother pure and simple of all the chickens she had so industriously hatched and brought off her fern embowered nest. As it often happens in the best regulated poultry yards, several other and bigger hens had smuggled their own eggs into Biddy's nest; a fact which would certainly have been a foregone conclusion in a few days from the difference in size of the chickens if for no other reason. I am sorry to say, however, that when the truth leaked out it was an every day scandal from one end of the poultry yard to the other. But Biddy the Bantam, like the brave little mother she was, pondered these things in her heart, lived down the wicked calumny and raised her family despite the alleged illegitimacy of three or four of the longer legged youngsters.

It was determined by the college authorities that everything should be done for the comfort of the rather untimely brood notwithstanding the lateness of the season and the threatened cold weather. To this end mother and chicks were put into a nice warm dry goods box with plenty of soft hay for a bed, and the whole establishment placed under the south veranda of our main building.

Well, with plenty of food the chickens grew, Biddy the Bantam was happy, and

all went along nicely till quite lately, when the chickens, having become about a quarter grown, it was discovered that Biddy could not cover them all at the same time, exert herself as best she might. Hence on each frosty morning it was evident that the chickens had suffered a good deal during the night. Their cries could be heard late at night and early in the morning as they crowded each other out into the bitter cold, the stronger ones striving to secure the warmest place under mamma's soft feather coverlet.

Now a dire emergency had come and something had to be done, and done it was in a most mysterious manner; and herein, also, is contained the gist of our story. The grievous complaint of the chickens came to a sudden discontinuation. Did the little hen mother in her deep affliction appeal to Sir Duke, the big rooster, for advice and succor? The sequel would certainly argue in favor of such a conclusion, for now he comes regularly every evening at early candle light, squeezes his bulky form through the bars of the coop, sits down by the side of Biddy the Bantam and spreads his broad

wings over more than half of the chickens. Peace, indeed, has returned and there are no more family jars in that little household.

It is a pleasant pastime to take a lantern and make a social evening call at the coop after Papa and Biddy have put their children to sleep. The most amusing thing of all is to hear the old rooster talk to the chickens. Thus, if anything goes wrong, any naughty crowding or some little foot trodden upon so as to cause an outcry, Papa slowly rises, shakes out his feathers, readjusts his great spreading toes, pokes in with his beak any little protruding head and then settles down again, all the while talking and saying in plain chicken lingo, "There, little dears, now nestle down and go to sleep."

In conclusion I will say to the readers of BIRDS AND NATURE that this little story is no fancy sketch but a true recital of events that took place at Vashon College while I was a member of the faculty of that institution. The chanticleer of every farmyard is a noble bird and a hero in his own sovereign right.

L. PHILO VENEN.

THE DAMSEL FLY.

This is a small insect—that is it is smaller than some of the dragon flies, to which order—Odonata—it belongs. It is of more gentle habits and not so swift of wing as the dragon fly. It was the French writers who gave it the name it bears, while some English authorities placed it along with the dragons. Howard says they are seldom found far from the stream or pond where they are born, yet I have two or three varieties that I caught on the prairie some miles from any water. Their wings are not held horizontally, but are folded parallel with

their bodies. This facilitates the backing down the stem of a plant or reed when the female wishes to deposit her eggs below the surface of the water, which is usually the place for incubation. The wings are gauze like, some nearly black, others with a beautiful metallic luster. They are not so savage as the dragons, although one I took last summer held on to the threads of the net until it nearly severed them, and bit at my fingers in a most savage manner.

ALVIN M. HENDEE.

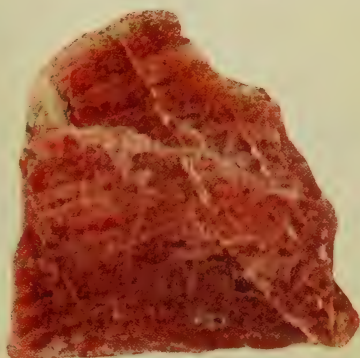
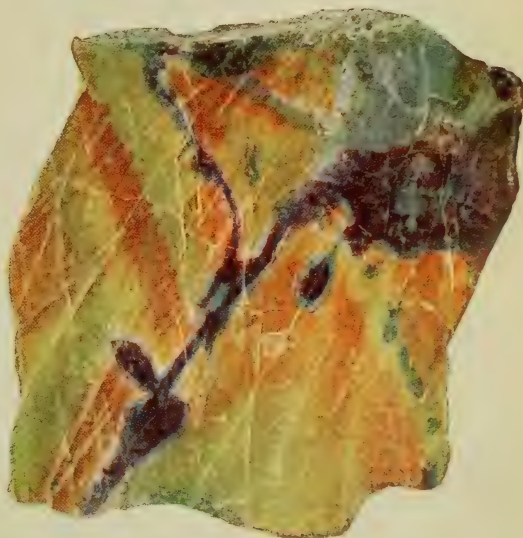
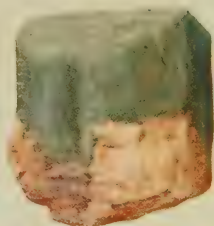
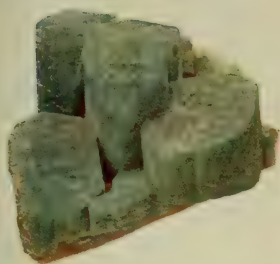
FELDSPAR.

Feldspar is the family name of several minerals closely related and indeed grading into each other, but distinguished by mineralogists by separate specific terms. These minerals are all silicates of aluminum, with some alkali or alkali earth, having a hardness of about 6 in the scale in which quartz is 7 and a specific gravity varying from 2.5 to 2.7. They are fusible with difficulty before the blowpipe, crystallize in the monoclinic or triclinic system and cleave in two well-marked directions nearly or quite at right angles to each other. It is this latter property, probably, which led to the grouping of these minerals as spar, since this term is applied in common language to any minerals which break with bright crystalline surfaces. Thus calc spar is a common name for calcite, heavy spar for barite, needle spar for aragonite, and so on. The term field spar, of which Feldspar is probably a corruption, was perhaps given the minerals of this group because of their widespread occurrence. The English spelling of the word is Felspar. The Feldspars form an essential part of nearly all eruptive rocks and by their decomposition produce clays and other soils which may harden into great areas of sedimentary rocks. They are thus of great geological importance and interest. Usually the white crystals to be seen in an eruptive rock in contrast to the dark green or black of the pyroxene or hornblende, or the glassy, nearly colorless quartz, are Feldspar. The Feldspar may, however, contain more or less iron and then take on a flesh color or become even darker. Feldspar crystals can best be recognized by their prominent cleavage, which appears as numerous bright flat surfaces extending in any given crystal in the same direction. The crystals, while they may be of so minute dimensions as to be visible only with the microscope, may on the other hand reach in veins in coarse-grained granites a length of a foot or more.

As ornamental stones only certain varieties of Feldspar are valued and their value depends on accidents of color or structure. The first of the Feldspars which may be mentioned as being prized as an ornamental stone is amazonstone or green Feldspar. This in composition is what is called a potash Feldspar, potash being the alkali which in combination with alumina and silica goes to make up the mineral. The percentages of each in a pure amazonstone are silica 64.7, alumina 18.4 and potash 16.9. The mineralogical name of the species is micro-cline, meaning small inclination, and refers to the fact that the angle between the two cleavages of the mineral is not quite a right angle. The common color of microcline is white to pale yellow, but occasionally green and red occur.

It is only to the green variety that the name of amazonstone is applied, a name meaning stone from the Amazon river. It first referred probably to jade or some such green stone from that locality and then came to include green Feldspar. No occurrence of green Feldspar in that region is now known.

Practically all the amazonstone now used for ornamental purposes comes from three localities. These are the vicinity of Miask in the Ural Mountains, Pike's Peak, Colorado, and Amelia Court House, Virginia. In all these places the amazonstone occurs in coarse-grained granite and is closely accompanied by quartz and Feldspar. All gradations are found in color from the deep green to white, only the bright green being prized for ornamental purposes. The Feldspar is usually well crystallized and crystals of several pounds weight may be found. A crystal will rarely be of a uniform color, streaks of paler green or white being commonly present. Only the uniformly colored portions are prized for ornamental purposes. The green often takes on a bluish tone and blue sometimes even predominates. The



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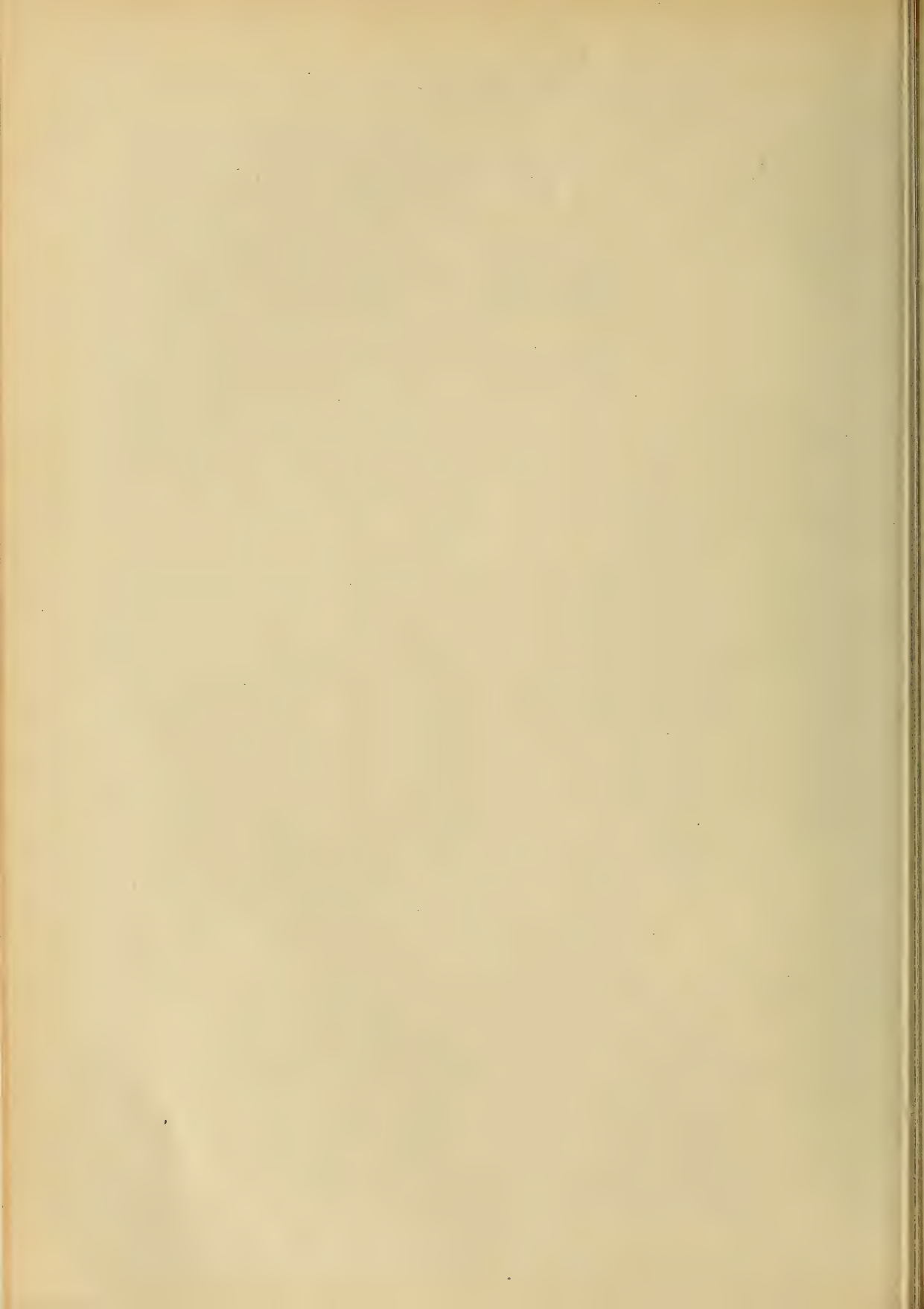
FELDSPAR.

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Amazonstone, crystallized (Colorado).
Labradorite, polished (Labrador).
Sunstone (Norway).

Amazonstone, crystallized (Colorado).

Amazonstone (Colorado).
Labradorite, polished (Labrador).
Moonstone, polished (Norway).



color is doubtless due to some organic matter, as it disappears, leaving the stone white, on heating. The stone is always opaque. Its use is not extensive, its sale being greater to tourists in the vicinity of the regions where it is found than to gem cutters. Several other localities in the United States besides those mentioned afford the mineral, though not in large quantities. It occurs in two or three localities in North Carolina; in Paris, Maine; Mount Desert, Maine; Rockport, Massachusetts; and Delaware county, Pennsylvania. The finest comes from the Pike's Peak locality. Mr. G. F. Kunz states in regard to these crystals that when they were first exhibited at the Centennial Exposition in Philadelphia in 1876 they were a great surprise to Russian dealers who had brought over some amazonstone from the Urals, expecting to sell it at what would now be considered fabulously high prices.

The second species of Feldspar which may be mentioned as of use as an ornamental stone is labradorite. This differs in composition from amazonstone in containing soda and lime in place of potash, the percentages in a typical labradorite being, silica 53.7, alumina 29.6, lime 11.8 and soda 4.8. Labradorite has the typical cleavage of Feldspar and cleavage surfaces in the direction of easiest cleavage are usually marked by rows of parallel striae. These show that the mass is made up of a series of crystal twins in parallel position and afford an excellent criterion for determining a triclinic Feldspar. Labradorite is a common rock-forming mineral, especially in the older rocks. It is only, however, when it occurs in large pieces which exhibit a play of colors that it is prized as an ornamental stone. The labradorite exhibiting the latter property in the most remarkable degree and hence most valued is that found on the coast of Labrador near Nain and the adjacent island of St. Paul. It was first found here by a Moravian missionary named Wolfe and brought to Europe in the year 1775. It occurs together with the form of pyroxene known as hypersthene, in a coarse-grained granite, or perhaps a gneiss. From these it is weathered out by wave and atmospheric

action and occurs as beach pebbles. It is also mined from veins. Labradorite of pleasing color and opalescence occurs in a few other localities in Canada, and in Essex county, New York, in the United States. Two localities occur in Russia, one near St. Petersburg and the other in the region of Kiew. The labradorite of the latter locality is the better, its occurrence being in a coarse-grained gabbro. The Labrador occurrence exceeds all others, however, in abundance and beauty and by far the larger quantity used in the arts comes from there. The play of colors which gives labradorite its attractiveness is rarely seen to advantage except upon a polished surface, but whether polished or unpolished it only appears when the surface is held at a particular angle with reference to the eye. Emerson thus describes it in his essay on Experience as illustrating the limitations of the individual: "A man is like a bit of Labrador spar, which has no lustre as you turn it in your hand until you come to a particular angle; then it shows deep and beautiful colors."

The play of colors seen in labradorite is not like that of the opal, which presents to the eye fragments of different colors varying in different positions, but appears as broad surfaces of a single color. It is only rarely that these colors change with a change of position. Bauer remarks that the appearance is similar to that seen on the wings of some tropical butterflies. The colors over any given surface are not necessarily alike, but more than two or three tints are rare. Each tint is uniform where it occurs. A surface may be interspersed with many spots exhibiting no sheen. Both colored and uncolored portions have only vague outlines and merge into each other at the edges. Bauer mentions a labradorite from Russia the colored portions of which formed a striking likeness of Louis XVI, the head being a beautiful blue against a gold green background, while above appeared a beautiful garnet red crown. Excellent effects are sometimes produced in labradorite by cutting it in the form of cameos so as to make the base of different color from the figure in relief. Of the different colors shown by labradorite blue and

green are the most common, yellow and red least so. These colors are regarded by Vogelsang as of different origin, the blue being, in his opinion, a polarization phenomenon due to the lamellar structure of the Feldspar, and the yellows and reds the result of the reflection of light from minute included crystals of magnetite, hematite and ilmenite. These lying in parallel position in great numbers in the labradorite give the colors.

The gems known as moonstone and sunstone owe the play of colors which gives them their respective names to similar causes. These gems are generally some form of Feldspar, although any mineral giving a similar sheen of color might be included under them. The moonstone of commerce comes chiefly from Ceylon, where it occurs in large pieces the size of a fist in a clay resulting from the decomposition of a porphyritic rock. Pieces of these when polished exhibit the beautiful pale blue light coming from within which makes the stone prized as a gem. The cause of this light is undoubtedly minute tabular crystals lying in parallel position through the stone.

The stone varies from translucent to opaque, and from colorless to white, the essential feature being the blue opalescent light or chatoyancy exhibited from a polished surface. Good moonstones are worth from three to five dollars a carat.

The Ceylon moonstone is sometimes known as Ceylon opal, but it is the variety of Feldspar known as orthoclase, which is a potash Feldspar, differing from the microcline just described in being monoclinic in crystallization and in having two cleavages meeting at right angles. Another species of Feldspar used as moonstone, is albite. This is a soda Feldspar and is triclinic, but exhibits the color characteristic of moonstone. One variety is known as peristerite, from the Greek word for pigeon, and is applied on account of the resemblance of the sheen to that of a pigeon's neck. It is found at Macomb, St. Lawrence county, New York. Albite found at Mineral Hill, Pennsylvania, also exhibits the chatoyancy of moonstone. Amelia Court House, Virginia, is another locality whence come pieces either of orthoclase

or oligoclase exhibiting this property. Like most of the more or less opaque gems, moonstone is cut chiefly in the rounded form known as *en cabochon*. It is of late, however, cut in the form of balls, which are quite popular, the bringing of good luck being attributed to them. The brilliancy of moonstone is considerably increased by mounting it against black.

Sunstone is the term by which those kinds of Feldspar are known which reflect a spangled yellow light. The appearance comes from minute crystals of iron oxide, hematite or gothite, which are included in the stone and both reflect the light and give it a reddish color. Like labradorite the sheen is visible only when the stone is held at a certain angle. Some specimens of the mineral carnallite, which is a chloride of potassium and magnesium, exhibit a similar sheen, and being soluble in water the crystals of hematite can be separated out. They are then seen to be perfect little hexagons of a blood-red color. The sheen of sunstone is best visible when the stone is held in the sunlight or strong artificial light. The variety of Feldspar to which the sunstone most in use at the present time belongs is oligoclase, a soda-lime triclinic Feldspar. Like labradorite it usually exhibits on the surface of easiest cleavage parallel striations due to twinning structure. The best sunstone at the present time comes from Tvedestrand, in southern Norway, where it occurs in compact masses together with white quartz, in veins, in gneiss. Some also comes from Hittero, Norway. In Werchne Udinsk, Siberia, another occurrence was discovered in 1831. Previous to this Bauer states that all the sunstone known came from the Island of Sattel in the White Sea, and was very costly, although of a quality which would not now be deemed desirable. At the present time, although stones of fine quality can be obtained, sunstone is little used in jewelry, and its market value is very low. Statesville, North Carolina, and Delaware county, Pennsylvania, are two localities in the United States where good sunstone has been obtained.

Both sunstone and moonstone can be accurately imitated in glass and the distinction of the artificial from the real by

ocular examination alone would be almost impossible. Glass, however, lacks the cleavage of Feldspar and is somewhat heavier and softer. The discovery of the method of making artificial sunstone is said to have been accidental, and was made at Murano, near Venice, when a quantity of brass filings by chance fell into a pot of melted glass. The product was for a long time and is still used in the arts under the name of goldstone. Sunstone is sometimes known as aventurine Feldspar, in distinction from aventurine quartz, which presents a similar appearance, owing to the inclusion of scales of mica. The term aventurine is from

the Italian *avventura*, meaning chance, and refers to the chance discovery above referred to.

Gems are occasionally cut from other forms of Feldspar than those here described, which are transparent and colorless and valued for their lustre. The varieties chiefly employed in this manner are *adularia*, a variety of orthoclase which is often transparent, the best specimens being obtained in Switzerland, and *oligoclase*, in the transparent form in which it is found near Bakersville, North Carolina.

OLIVER CUMMINGS FARRINGTON.

THE WOOD HARMONY.

Who knows the dim, least-traveled way
Where wood-folk keep their holiday;
Who knows the paths of little care
Whereon the thicket-dwellers fare,
Let him be heedful, lest he wake
Unfriendly echoes in the brake,
Or dare, with alien thought, to find
His way among the timid kind.
Let him beware, then, for they know
The subtle footsteps of a foe.
But all the wee wood-fellows spare
Such welcome as they ever share
To him who finds in dale and dell
That undefined, familiar spell
That greets the faith prepared to meet
A faith as beautiful and sweet.

—FRANK WALCOTT HUTT.

THE COTTAGE BY THE WOOD.

It was my good fortune to spend some months in a cozy little cottage in a suburban district, the natural surroundings of which were such as to at once appeal to a naturalist, aside from furnishing ample opportunity for rest and quiet. The large lawn belonging to the property, with its abundance of shade trees, fronted on the main avenue of a populous corporate town, while in the rear was a strip of woodland, which in turn was bordered by a clearing covered mainly by briars and thick low bushes, its whole length being intersected by a winding brook.

Birds in the locality were quite numerous and some of them showed remarkable tameness. During the hours of night time, giving voice as it were to the weird lights and shadows around the house, we could hear the mournful ditty of a screech owl whose home was in a nearby hickory tree, while the first gray streak of each returning dawn was heralded by the sweet songs of the robins. Flickers were frequently seen hopping around in the grass near the roots of various trees; the notes of the yellow-billed cuckoo were also heard in the thick foliage of the maples: redeyed vireos kept up a continual warbling all day long and doubtless had a nest in the vicinity, as we observed the mother bird feeding two very young ones; the latter being perched in a low bush in the yard. The happy song the house wrens was always in evidence and three nests were built under the porch roof. I personally observed one of the broods leaving the nest and was surprised to see two of their number climb up the straight trunk of a wild cherry tree—genuine woodpecker fashion—for a distance of twelve or fifteen feet, where the limbs began to branch out. However, they arrived at the top safely and remained there for the balance of the day.

Humming birds often came and hovered over the many beautiful flowers in the yard, and sometimes consented to alight for a few minutes for our benefit. On one of these occasions a party of five

(including my baby daughter) approached to within three feet of the flower stalk upon which our little visitor was perched; still it sat there, turning its wee head this way and that, looking at us with fearless unconcern. At last it gave a sharp chirp, flew, and was soon lost to sight. On one occasion in the early morning, we were greeted with the familiar call "Bob White," which seemed to come from the woods in the rear of the yard. The call was repeated several times, but we were unable to discover the author of it. A tree of fine red cherries proved a great attraction for cat birds and other feathered fruit lovers. But what we considered the greatest privilege, and one which was exceedingly enjoyed, was the daily greeting of the wood thrushes during the breakfast hour. What could be more charming than to sit leisurely eating the morning meal and all the while listening to the sweet, clear strains of the loveliest bird songs pouring from the throats of the russet-brown vocalists just outside the kitchen window, peal after peal, in endless volume and variation. In addition to the birds already mentioned we sometimes heard the shrill scream of the blue jay, also the notes of the king birds and crested flycatchers, while from the distance, floating to us from across some field or meadow, came the morning praises of a meadow lark or the well known call of the kildeer. The crows also added their deep caw-caw-caw to the chorus of woodland voices. The clearing above referred to proved to be the home of two or three species of the warbler family, and a walk through the vicinity the following winter revealed a number of nests. They were all placed low, and one of them showed every indication of having been built and occupied by an oven bird.

The usual wild flowers of the season were abundant and the surrounding country at large was admirably suited for exploration and research; hence our sojourn at the "Cottage" was one of great pleasure and instruction.

BERTON MERCER.



A NEW ARGYNNIS.

The butterfly to which I want to introduce you is a rare beauty! It is called *Argynnis nitocris nigrocaerulea* by scientists, but the young people of our school call it the blue-black silver spot or the Sapello Fritillary. They wanted very much to name it after the Territory, but unfortunately there is a butterfly of this genus that bears the name of New Mexico Silver-spot.

Every member of the genus *Argynnis* is beautiful and it is a great treat to see the glint of the silver dotted wings of these butterflies as they hover about the gaily colored flowers in some mountain canyon or alpine meadow. But no member of the genus will compare in beauty with the female of the *nigrocaerulea*, and I should find difficulty in forgetting the pleasure I felt in seeing two of these lovely creatures sucking the nectar from a large bright colored *Rudbeckia*.

The *nigrocaerulea* is very much like a silver-spot that is found in the mountains of Arizona; both belong to the species *nitocris* and there is still a third form found in the mountains of Mexico. It is very likely that these forms were the same years ago, but the mountains in this arid region are like islands, and are separated by dry expanses upon which an *Argynnis* could not live. It follows, therefore, that in the isolated mountain regions many forms of the same species may be found, and when the country has

been more carefully explored we shall very probably find other varieties of *nitocris*.

The *nigrocaerulea* was discovered in August, 1900, in the Sapello Canyon, a beautiful canyon in the Rocky Mountains near Las Vegas, New Mexico. The male is reddish-fulvous on the upper surface, with well defined markings consisting of waved transverse lines and crescent shaped spots. On the under side the design of the fore wings is somewhat indistinctly repeated, and the base is colored with a most exquisite reddish pink. The under surface of the hind wings is a rich brown with a wide yellow border, and is profusely marked with spots of glistening silver. The female on the upper side is bluish black, well marked near the margin by large spots of yellow suffused with blue. The under surface is very like that of the male, though the colors are more pronounced, the brown in the hind wing merging into black. The Sapello Fritillary flies during the month of August. Though the caterpillar is not known, it is supposed to feed upon the leaves of violets, which grow very abundantly in the Sapello Canyon. Diligent search will be made for it, and I am sure all will be interested if at some future time I can give the history and picture of the chrysalis of this beautiful Silver-spot.

WILMATTE PORTER COCKERELL.

Lo, the bright train their radiant wings unfold!
With silver fringed, and freckled o'er with gold:
On the gay bosom of some fragrant flower
They, idly fluttering, live their little hour;
Their life all pleasure, and their task all play,
All spring their age, and sunshine all their day.

—MRS. BARBAULD.

BUTTERFLY.

Butterfly, on golden wings,
Tell us of your wanderings!
Tell us of aerial spaces,
Where, in pleasant sunshine places,
You go sailing high and low,
Wheresoever you would go!

Leisure, freedom, grace, is yours;
Earth and air to you ensures
Findings for your utmost need,
Be it blossom, dewdrop, seed;
And you roam the fields of air,
Happy, and without a care.

When the sudden storm comes down,
And the sun flees at its frown,
You with folded wings will hide
'Neath a leaf, and safely bide
Till the tempest flashes through,
And the sky is blue for you.

Thus on rested wings you sail
In the wake of every gale,
Sailing high, or sailing low,
Whersoever you would go;
Pilgriming the great, blue sky;
Bravo, little butterfly!

—M. D. TOLMAN.

A PROLIFIC PEACH TREE STUMP.

One day early in the spring, while taking bird notes I discovered a pair of chickadees busily engaged in constructing a home. They had chosen an old peach tree that stood just back of the yard and were rapidly excavating a beautifully rounded circle in the decayed stump.

Perching in the mouth of the cavity the chickadee's body would almost dis-

appear within and then he would withdraw himself and fly away with a tiny chip of rotten wood in his beak. After the cavity was satisfactorily completed they began lining the interior, which formed the nest proper. These fastidious little feathered architects consider nothing less than soft clean fur suitable material for a bed for their delicate speckled eggs. In this instance rab-

bit's fur was used, which was identified by the fringe of loose hair that clung to the entrance, for the hollow was too deep to look down into the nest.

Some time after the discovery of the chickadees' habitation, when the peaches and plums were in blossom and the air soft and balmy the wrens arrived from their winter home.

These inquisitive little creatures peer out very knowingly from their retreat amidst the verdure, at anyone who comes near, and they win the heart of all by their pert manners and love of human companionship. These modestly attired little warblers are extremely lively and nimbly search among the foliage for food, destroying many harmful insects.

In scanning every possible and impossible place about the premises for a suitable nesting site, one of these dapper little fellows spied the snugger in the stump which captivated his fancy, and he forthwith proceeded to try to take possession. But such outrageous trespassing was not to be allowed for a moment by the chickadees and whenever the little brown rogue crept up to the entrance to peep in, out would pop the proprietor, in his jaunty black cap, and put him to flight. The intruder would then perch on a branch near by, stretch himself to his full height, with tail erect, as though to appear of as much consequence as possible, and alternately scold and pour forth defiant song at his opponent. This antagonism was kept up for several days, till finally the wrens gave up the contest and began furnishing a neat little bird house in a maple tree close by.

When they had nearly completed their labor the young chickadees left the nest to follow their sprightly parents about the orchard, whereupon the whimsical but industrious wrens immediately abandoned their pretty summer cottage to occupy the now vacant cavity in the stump. These two little birds (chickadee and wren), much alike in some respects, show a very decided difference in the choice of nesting material. The hollow was soon filled to overflowing

with sticks, the main substance of every wren's nest.

In due season a brood issued forth, followed by another later, to swell the young bird population, then at its height. Only think of the amount of extravagant activity and drollery that was reared in that cavity nursery!

As the Creator did not implant the migratory instinct, except in the very slightest measure in the chickadee's nature, his travels are mostly local and his spruce little form may be seen in all seasons. During the fall and winter, after the fidgety wrens have departed for the sunny southland, is the most favorable time to study the habits of the chickadee. His actions may then be observed most readily, as he flits among the bare branches in search of prey, occasionally taking time to utter his cheerful chickadee-dee.

He is a great aid to the fruit grower. Let anyone that doubts this repair to an orchard and observe a company of them taking their meals. And it is an interesting sight to watch a merry party of these little creatures, as with never-ceasing activity they dexterously explore the trees for food. With the greatest nicety they poise in every conceivable attitude; from the trunk they dart to the topmost spray, now to the center of the tree and then instantly to the outside branches. While searching the trunk or a perpendicular branch, the head may be upward or the reverse; or if a horizontal branch is undergoing examination his feet are as likely to point heavenward as not; or he may hang suspended from a swaying twig. Ever in motion, flitting, hopping, swinging to and fro, they investigate every nook and cranny and draw numberless injurious insects, their eggs and larvae from their lurking places. The chickadee's tongue, a fork-shaped instrument, is admirably adapted to prying its prey out of crevices of bark.

They by no means confine their work to the orchard, but all kinds of trees and shrubs are alike visited. In thus performing the duty assigned them by Nature they are of inestimable service to man.

ADDIE L. BOOKER.

THE COWRIES AND SHELL MONEY.

Among marine mollusks none stand so favorably in the eyes of collectors or are so beautiful as the *Cypraea*s, or Cowry shells. With their glossy coats and varied colors they are indeed gems of the ocean, and it is little wonder that the conchologist has placed them first among the many families of marine shells.

The name *Cypraea* comes from *Cypris*, one of the names of the goddess *Venus*. About two hundred recent species have been described and they are found in nearly all parts of the world, though more numerous in the tropics and subtropics, where they live on coral reefs and under rocks. As in many other genera of shells the Cowries living in the tropics are more brilliantly colored than those from more temperate climes, a condition due to the large amount of sunshine and high temperature, both of these factors being essential to the secretion of color in the pigment cells of the animal.

The animal which inhabits a Cowry shell is a curiosity. The foot is large and spreads out in a wide mass, enabling the animal to glide along quite rapidly. The mantle lobes are folded over the back of the shell and are beset with many little tuft-like organs which stick out like young shoots on a plant. The mouth is placed at the end of a rather long snout or rostrum and the eyes are upon the outside of two long, tapering tentacles, about one-third the distance from the body. When the shell is young it is covered with a thin epidermis and has a thin, sharp outer lip, like some snails, but when it is full grown the outer lip rolls inward, becomes toothed or ridged, as does also the inner lip, and the aperture becomes a long and narrow slit reaching from the apex to the base of the shell. The mantle lobes, which are inconspicuous in the young shell, becomes larger and are reflected over the back, depositing coat after coat

of shelly enamel until the first pattern of the shell, as well as the epidermis, is covered with a secondary, shining coat. On most *Cypraea*s there is a line of paler color, showing where the two lobes of the mantle meet on the back.

Like many other mollusks the *Cypraea* is able to dissolve the internal whorls and thus enlarge the capacity of its shell. This is also true of *Conus*, and *Murex*, and some other marine snails dissolve the spines which may be in the way when increasing the size of the whorls. The older naturalists, Lamarck and Bruguiere, believed that the *Cypraea* was able to dissolve its outer lip after it had been rolled over and toothed, but this theory has been proved to be incorrect. They founded their belief on the fact that some individuals of the same species were larger than others. This, however, is due simply to individual variation.

The beautiful colors so much admired are deposited by the reflected mantle and their variety is almost endless. Some are perfectly plain, white, brownish, yellowish or orange, others are spotted with red, white, brown, drab or black, and still others are variously banded. The eyed-cowry (*Cypraea argus*) has large, dark brown spots on a lighter background.

In form and sculpture the Cowries present a rather wide range of variation. The typical form is more or less cylindrical, or pyriform, while others are flat, oval or egg-shaped. The surface varies from smooth to spirally-lined and pustulose. In size they vary from the little *Trivia exigua*, scarcely one-fourth of an inch long, to the huge *Cypraea testudinaria*, nearly five inches in length.

Many of the larger species, like the tiger cowry (*Cypraea tigris*) and the black cowry (*Cypraea mauritiana*) have been household ornaments for centuries and have also served as playthings for



FROM COL. CHI. ACAD. SCIENCES.

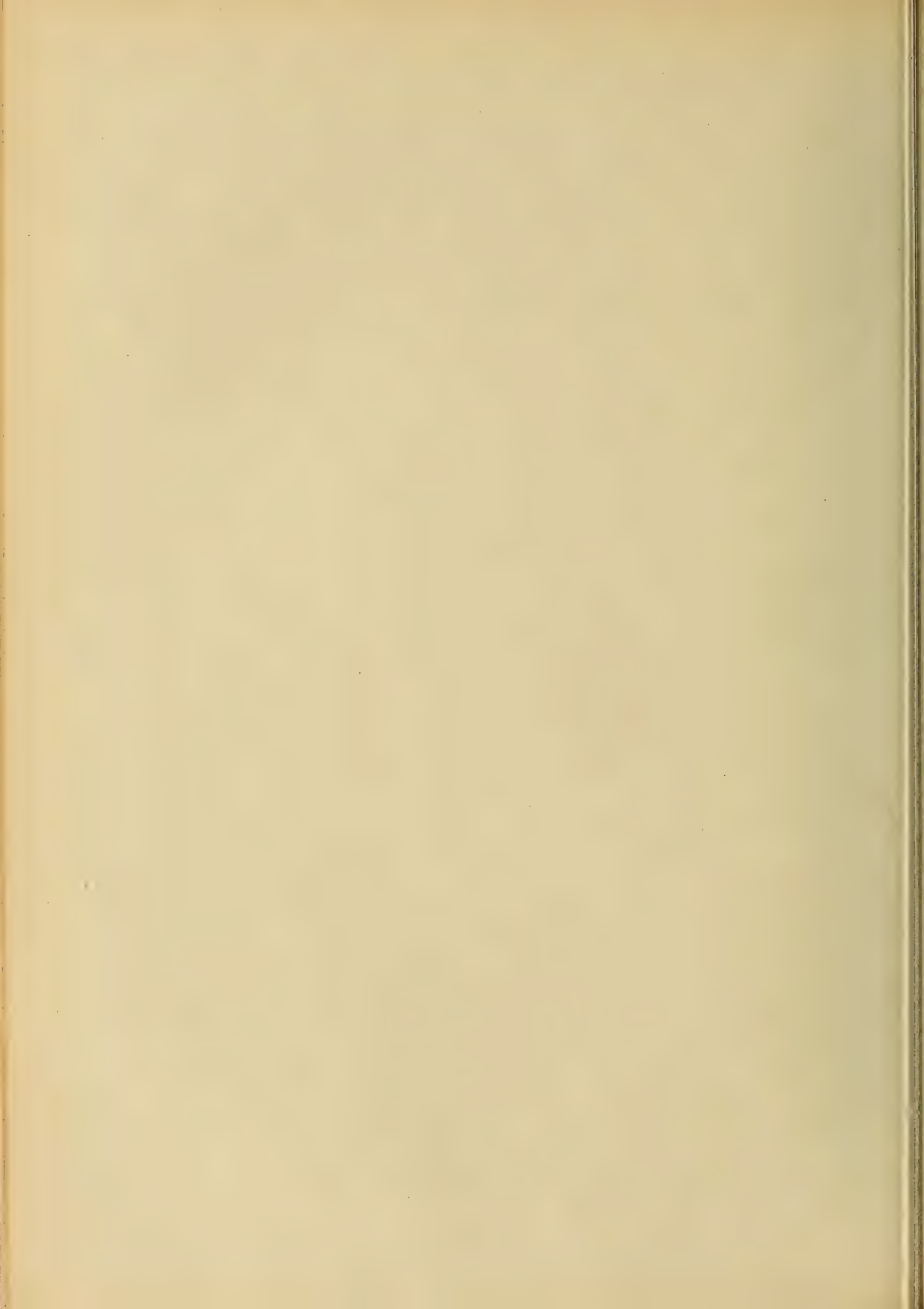
COWRY SHELLS.

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Cypraea exanthema (Half grown.)
Trivia solandri (California).
Cypraea erosa (Indian Ocean).
Cypraea spadicea (California).
Cypraea talpa (Pacific Ocean).

Cypraea exanthema (Young).
Cypraea mus (Europe).

Cypraea exanthema (Florida).
Cypraea annulus (Indian Ocean).
Cypraea lurida (Mediterranean Sea).
Cypraea moneta (Philippines).
Cypraea histrio (Indian Ocean).



young children, who have held them to their ears to "hear the sound of the roaring sea."

In habits the Cowries are shy and they are slow in movement, sliding over the coral reefs and marine vegetation with a sluggish, steady motion. They present a beautiful sight when viewed through the water, their brilliant colors vying with those of corals, sea anemones and sea weeds. They are said to feed principally upon the coral animals.

From very ancient times the smaller Cowries have been used for adornment or barter. The *Cypraea annulus*, or ringed cowrie, which was found by Dr. Layard in the ruins of Nimroud, is said to be the same species which is now used by the islanders of the Indian and Pacific Oceans to weight their fish nets and to adorn their persons. In western Africa the money cowry (*Cypraea moneta*) has been and is now used as a medium of exchange in place of gold. Many tons were yearly shipped to England from the Indian and Pacific Oceans, to be again carried to Africa to barter with the natives for ivory and other articles.

The number of Cowries which have been given for various articles, with their value in American currency, is interesting. Thus it is recorded by the Conchologist Reeve that a gentleman residing at Cuttack in India paid for the building of his bungalow entirely in Cowries, giving over sixteen million specimens. The value of these Cowries was four thousand rupees sicca in Indian money, or about two thousand dollars in American money. In another place it is recorded that a young wife cost from sixty thousand to one million Cowries, or from about nineteen dollars to thirty-seven dollars, while an ordinary wife cost but twenty thousand shells or about six dollars.

The value of Cowries varies in different countries. In India five or six thousand may be purchased for one rupee, while in parts of Africa two hundred Cowries are worth sixteen cents. In Sudan, two thousand Cowries, which weigh about seven pounds, are worth one dollar. On the west coast of Africa, where trading in Cowries is largely car-

ried on, the following gradation of value is recorded by Dr. Stearns:

40 Cowries	= 1 string.
2½ strings	= 1 pence.
100 Cowries	= 1 pence.
50 strings	= 1 head of Cowries.
10 heads	= 1 bag.
2,000 Cowries	= 1 head.
3 heads	= 1 dollar.
20,000 Cowries	= 1 bag.

In other places the value is about 1s. 3d. for 1,000 shells.

The money cowry is also used as ornaments on the trappings of horses and elephants, as well as on the persons of men and women. The rich yellow variety is much sought after by the chiefs of several island tribes, who permit no one but themselves or their sub-chiefs to wear them.

We may truly say that of all the mollusks, large or small, handsome or ugly, the modest little money cowry surpasses any in point of economical importance.

In the Friendly Islands the orange cowry (*Cypraea aurantia*) is used as a badge of chieftainship and for a long time specimens were almost priceless because no one but the chief was allowed to wear this ornament. Specimens of this species are frequently seen in collections, with a hole in the back by means of which it was suspended about the neck of the native chief.

Those who have described the Cowries have given them many fanciful names, some of which, however, are quite appropriate. Thus we have the *caput serpentis* or serpent's head; the *arabica* or Arab shell, so named from the peculiar, hieroglyphic-like characters on its back; the *lynx*, *pantherina* and *tigris*, each shell resembling the coat of the lynx, panther and tiger; *mus*, the rat shell; *rhinoceros*, the rhinoceros shell; *turdus* the thrush, and *cervus* the deer. Many of the other names are equally well chosen, as *moppa* the mop cowry, and *pustulata* the pustulose cowry.

It is interesting to note the prices that have been paid for rare specimens of this family. At an auction held in London many years ago a specimen of *Cypraea guttata* brought two hundred dollars, and *Cypraea princeps*, another very rare shell, brought the same price. *Cypraea umbilicata* once sold for one hundred and

fifty dollars, but may now be had for five dollars. *Aurantia*, the orange cowry, was once almost priceless, but is now sold at from twenty to forty dollars. Some of the lesser rarities are *Cypraea scoltii*, worth from five to eight dollars, and *Cypraea decipiens*, worth from fifteen to twenty dollars. These extravagant prices need not be paid by any one desiring a collection of these pretty shells, for the price of a single rarity will suffice to purchase the majority of the common species. Several private collections in the United States contain from one hundred fifty to one hundred seventy species, including a number of the rarities spoken of above.

In connection with the *Cypraea*s it is interesting to notice other species of shell money which have been used as money. The North American Indians used fragments of shells for money, which they called wampum. In New England wampum was in the form of beads, the manufacture of which required considerable skill. These beads were cylindrical in form, about one-fourth of an inch long and half as wide. They were of two colors and were drilled and strung on long cords.

The quahog (*Venus mercenaria*) was much used in the manufacture of shell money because of its two decided colors, pure white and deep purple. The white beads were called wampum or wompom and the black beads suckauhock, or black money. In addition to the quahog the whelk *Buccinum* and the "periwinkle" or "winkle" were used, the long, white columella being cut from the shell and made into beads.

We learn from some of the older records that in Massachusetts the wampum was valued at three beads to a penny or five shillings for a fathom. The fathom varied in size according to the number of beads allowed by law as an equivalent to a penny. If this was six, then the

fathom contained three hundred and sixty beads, but if the number was four, then the fathom was composed of two hundred forty beads. Owing to the counterfeiting of wampum by the whites, who could make it much quicker with their tools than could the Indians, the value rapidly fell in later years and its use was finally discontinued.

On the coast of California the tooth or tusk shells, *Dentalium*, were used as money, being strung together as were the beads of the New England Indians. Those of the better quality were called Phai-Kwa or hi-qua and represented the highest standard of money. One hi-qua would purchase one male or two female slaves. The damaged or defective shells were called kop-kops, forty of which equalled one hi-qua in value. At one time a single hi-qua was equal in value to about two hundred fifty dollars. Other shells were also used on the Pacific coast, some of which were simply strung in the form of beads while others were cut from large shells. One of the latter was from the large clam, *Pachydesma crassatelloides*, and the pieces were called hawock or ha-wok, their value ranging from four to twenty-five cents. Another clam used was the *Saxidomus aratus*.

The little *Olivella biplicata* was used for beads and was called hol-kol. They were made by grinding off the apex, which left a hole through the top of the shell. The *Haliotis* or abalone was also used and was called uhl-lo. Pieces of the shell one or two inches in length were cut from the flat part of the abalone, a hole was drilled in one end and they were strung like beads. Their value was one dollar each, or ten dollars for a string of ten pieces. Like the shell money of New England that of the Pacific coast was counterfeited by the whites and for this reason the value of the native currency soon declined.

FRANK COLLINS BAKER.

THE BIRD OF SUPERSTITION.

There are several possible reasons why the owl has always been regarded as an ominous bird. Something uncanny seems to inhere in its noiseless flight, something unearthly to look out from its large, strange eyes. Even its voice arouses an eerie feeling, which is increased by the knowledge of its nocturnal habits. The poets are fond of alluding to its auguries of evil, Shakespeare alone finding a merry note in its "Tu-whit, tu-whoo," and even he added an "owlet's ring" to the noisome ingredients of the witches' cauldron in *Macbeth*. He also speaks of

The fatal bellman
That givest the stern'st good night.
Chaucer speaks of the screech owl as
The prophet of woe and of mischance,
while Spencer alludes to—
The whistler shrill, that whoso hears doth
die.

Roman soothsayers were accustomed to use owls' feathers in their incantations. In many places its note is still considered a sure sign of impending death. In *Borneo*, it is said, that if a person on entering a forest hears the voice of an owl, he will at once return. The Mexicans, Indians and Basque shepherds regard the monkey-faced owl as an omen of ill-luck.

There is a story that *Agrippa* was so superstitious that when he beheld an owl perched over him on the occasion when the people shouted, "It is not the voice of a man, but of a God!" that he felt assured of the speedy death which followed.

But, on the other hand, instead of a prophet of evil, legend has it that the owl is the "bird of wisdom." It was certainly consecrated to the service of *Pallas Athene* by the wise Greeks, whether on account of a certain air of intelligence, or because the goddess was herself the moon and therefore a nocturnal bird would be especially appropriate, we may never know.

There is a story to the effect that on one occasion, when an emblem of wisdom was to be chosen, all the contestants for the honor were finally eliminated except the Philosopher and the Owl. When the arguments in favor of the Philosopher had been duly considered, the Owl lifted up his voice and hooted: "I do not profess to embody all knowledge, but I have that which is better. I possess the art of concealing my ignorance." Whereupon the judges, delighted with the idea, unanimously elected him as the better emblem of wisdom!

Many ancient customs had their origin in *Egypt*. The Egyptian wise men told the most learned of the Greeks that in knowledge they were but children compared with themselves. The superstitions regarding the owl may have arisen on the banks of the Nile, from a custom of the king of the country, who, whenever the death of a person was decided upon, sent to such individual the image of an owl, whereupon the unfortunate one was expected to kill himself at once. Small wonder the owl became in time a bird of ill-omen.

BELLE PAXON DRURY.

THE WISCONSIN DELLS.

Half-veiled by a purple haze,
The cliffs and crags, their turrets raise,
The fragrant forests, umber, green,
Scintillate in the sunlight's sheen,
And whispering low, through clinging vines,
A berceuse comes from singing pines.

—ILLYRIA TURNER.

MY SUMMER NIGHT.

The dear voice of the summer night
Sings in my listening ear
A melody of joyous flight,
In sweetest cadence here.

I love the cricket's monotone;
It almost seems to me
That star-notes, through the ether blown,
Have lodged in grass and tree.

A beetle, swinging down the field,
Booms on the lighted pane;
And, as it strikes, a thought revealed
Taps at my quivering brain.

The "peas and pork" bird in the air—
The solemn whip-poor-will—
Both thoughts of quaintest mystery bear
From off yon shadowed hill.

A silk-worm moth, with purple "eyes"
Upon its nether wings,
Around the lighted window flies,
Or to the casement clings.

So, all the eve, the gathering gloom
Speaks with its voices low;
Hearts unto hearts, in bits of bloom,
On summer evenings flow.

—WILLIS EDWIN HURD.



THE CHERRY.

(*Prunus cerasus* L.)

Sauerkirsche, Weichsalkirsche, G. Cerisier, Griottier, Fr.

Sweet is the air with the budding haws, and the valley stretching for miles below
Is white with blossoming cherry-trees, as if just covered with lightest snow.

—LONGFELLOW: "Christus. The Golden Legend."

The cherry-trees belong to the Rose family (Rosaceae) and are thus botanically related to the apple, rose, pear and strawberry. The numerous cultivated varieties are doubtless derived from the cherry whose original home was Asia Minor, from which country it spread to Europe and other countries many centuries ago. The plants are trees, mostly not large but handsome because of the green, simple, glossy serrated leaves and the beautiful numerous white flowers and the attractive red fruit. Pliny described the plant and designated Asia as its original home. About 63 B. C. the plant was brought to Rome. From Italy the cherry rapidly spread through Europe, for it was cultivated along the Rhine countries, in Belgium and in England, even during the time of Pliny. Alexander Trallianus recommended the fruit very highly in the treatment of consumption and in diseases of the liver.

In the language of flowers cherry blossoms signify inconstancy, which is somewhat peculiar, since the tree and the fruit are so frequently mentioned in a favorable sense in legend and folklore. Christ at one time gave Peter a cherry with the admonition not to despise little things. The tree is also consecrated to the Virgin Mary according to a tradition.

Cherry trees are cultivated throughout all civilized countries. As with most other long cultivated fruits the various varieties are the product of crossing (cross-pollination), artificial selection and cultivation, and desirable plants are perpetuated by grafting. There are various wild growing species of cherry, which must not be confused with the

cultivated varieties. The wild black cherry (*Prunus serotina*) is very common in our woods. It is a handsome tree, varying from 15 to 100 feet in height. It has a smooth bark on the younger branches. The fruit is rather small, fleshy portion thin and of a very dark color when fully ripened. The wild black cherry must not be confused with the poisonous choke cherry (*Prunus virginiana*), which is a smaller tree and has red berries instead of black. Double caution is necessary since the scientific names are interchanged in various works. There is another Eastern cherry known as wild red, bird or pin cherry (*Prunus pennsylvanica*), which also has red fruit. There is also the common sweet cherry (*Prunus avium*). The common peach (*Prunus persica*) and the common garden plum (*Prunus domestica*) are close of kin.

The fruit of the cultivated domestic cherry is the most desirable and is usually had in mind when cherries are mentioned. The fruit is technically a stone fruit or drupe and not a berry; the outer portion of the fruit covering known as exocarp is fleshy and constitutes the edible portion. The endocarp is hard and forms the shell which encloses the seed. The fresh, fully ripened fruits are relished most by children, as well as by adults. Birds also are very fond of ripe cherries. Robins are on such a keen lookout for the ripening berries that the busy farmer is often a total loser. These birds often guard the trees jealously against all intruders, clamorously alighting on the very heads and shoulders of the boys who presume to climb the trees to pick the fruit.

Cherry wine is made from the fleshy pulp, which has an excellent quality and flavor. Cherry syrup is the product of fermentation and filtration with the addition of sugar and is used as a flavor for cold drinks and added to medicines to improve their efficiency and to disguise the taste. By crushing and distilling the seeds cherry water is obtained. The flowers and fruit stems are employed in kidney and catarrhal troubles. Cherries may be preserved by drying or pickling. The fruits are also macerated in whisky and brandy, adding to these drinks an agreeable flavor and acidity. For this purpose the fruit of the wild black cherry is very extensively used. The bark,

particularly of the wild black cherry, is extensively employed in medicine. It is a very popular household remedy for the treatment of coughs and colds in children. The gum which exudes from the incised or otherwise injured bark is also used medicinally.

Cherry wood is hard and takes a good polish. It is used in cabinet making, interior finish and for inlaid work.

Cherries are also employed by the confectioner and by the baker in making pies. The seeds (kernels, pits) are first removed. The habit of swallowing the pits is a dangerous one, as serious and even fatal troubles are caused by them.

ALBERT SCHNEIDER.

NASTURTIUMS.

A tangle of broad, green leaves,
All over the garden border;
A mass of wonderful blooms,
Parading their gay disorder.

Petals of sunset and flame,
Their orient, velvet-soft splendor
Aflare on long, sinuous stems,
Aromatic, pale-tinted and slender.

Trespassers wilful and bold,
Wherever they choose they wander,
Spendthrift of color and scent—
Made but to riot and squander.

E'en to the court of the rose,
Their eager, loose tendrils outreaching;
Unable to guess at her pride,
Or to care for her thorn's sharp teaching.

Yet such is their charm and delight,
One pauses, half ready to flout them;
For O, at the mid-summer's height,
What were the garden without them?

—LULU WHEDON MITCHELL.

BIRDS AND NATURE.

ILLUSTRATED BY COLOR PHOTOGRAPHY.

VOL. XII.

OCTOBER, 1902.

No. 3

AUTUMN WOODS.

Ere, in the northern gale,
The summer tresses of the trees are gone,
The woods of Autumn, all around our vale,
Have put their glory on.

The mountains that infold,
In their wide sweep, the colored landscape round,
Seem groups of giant kings, in purple and gold,
That guard the enchanted ground.

I roam the woods that crown
The uplands, where the mingled splendors glow,
Where the gay company of trees look down
On the green fields below.

My steps are not alone
In these bright walks; the sweet southwest, at play,
Flies, rustling, where the painted leaves are strown
Along the winding way.

And far in heaven, the while,
The sun, that sends that gale to wander here,
Pours out on the fair earth his quiet smile—
The sweetest of the year.

—WILLIAM CULLEN BRYANT.

THE PHILIPPINE SUN-BIRD.

(*Cinnyris jugularis*.)

Darlings of children and of bard,
Perfect kinds by vice unmarred,
All of worth and beauty set
Gems in Nature's cabinet:
These the fables she esteems
Reality most like to dreams.

—Ralph Waldo Emerson, "Nature."

The sun-birds bear a similar relation to the oriental tropics that the humming birds do to the warmer regions of the Western hemisphere. Both have a remarkably brilliant plumage which is in harmony with the gorgeous flowers that grow in the tropical fields. It is probable that natives of Asia first gave the name sun-birds to these bright creatures because of their splendid and shining plumage. By the Anglo-Indians they have been called hummingbirds, but they are perching birds while the hummingbirds are not. There are over one hundred species of these birds. They are graceful in all their motions and very active in their habits. Like the hummingbirds, they flit from flower to flower, feeding on the minute insects which are attracted by the nectar, and probably to some extent on the honey, for their tongues are fitted for gathering it. However, their habit while gathering food is unlike that of the hummingbird, for they do not hover over the flower, but perch upon it while feeding. The plumage of the males nearly always dif-

fers very strongly from that of the females. The brilliantly colored patches are unlike those of the hummingbirds for they blend gradually and are not sharply contrasted, though the iridescent character is just as marked. The bills are long and slender, finely pointed and curved. The edges of the mandibles are finely serrated.

The nests are beautiful structures suspended from the end of a bough or even from the underside of a leaf. The entrance is near the top and usually on the side. Over the entrance a projecting portico is often constructed. The outside of the nest is usually covered with coarse materials, apparently to give the effect of a pile of rubbish. Two eggs are usually laid in these cozy homes, but in rare instances three have been found. The Philippine Sun-bird of our illustration is a native of the Philippines and is found on nearly all the islands from Luzon to Mindanao. The throat of the male has a beautiful iridescence shaded with green, while that of the female, shown on the nest, is yellow.

Fly, white butterflies, out to sea,
Frail pale wings for the winds to try;
Small white wings that we scarce can see
Here and there may a chance-caught eye
Fly.

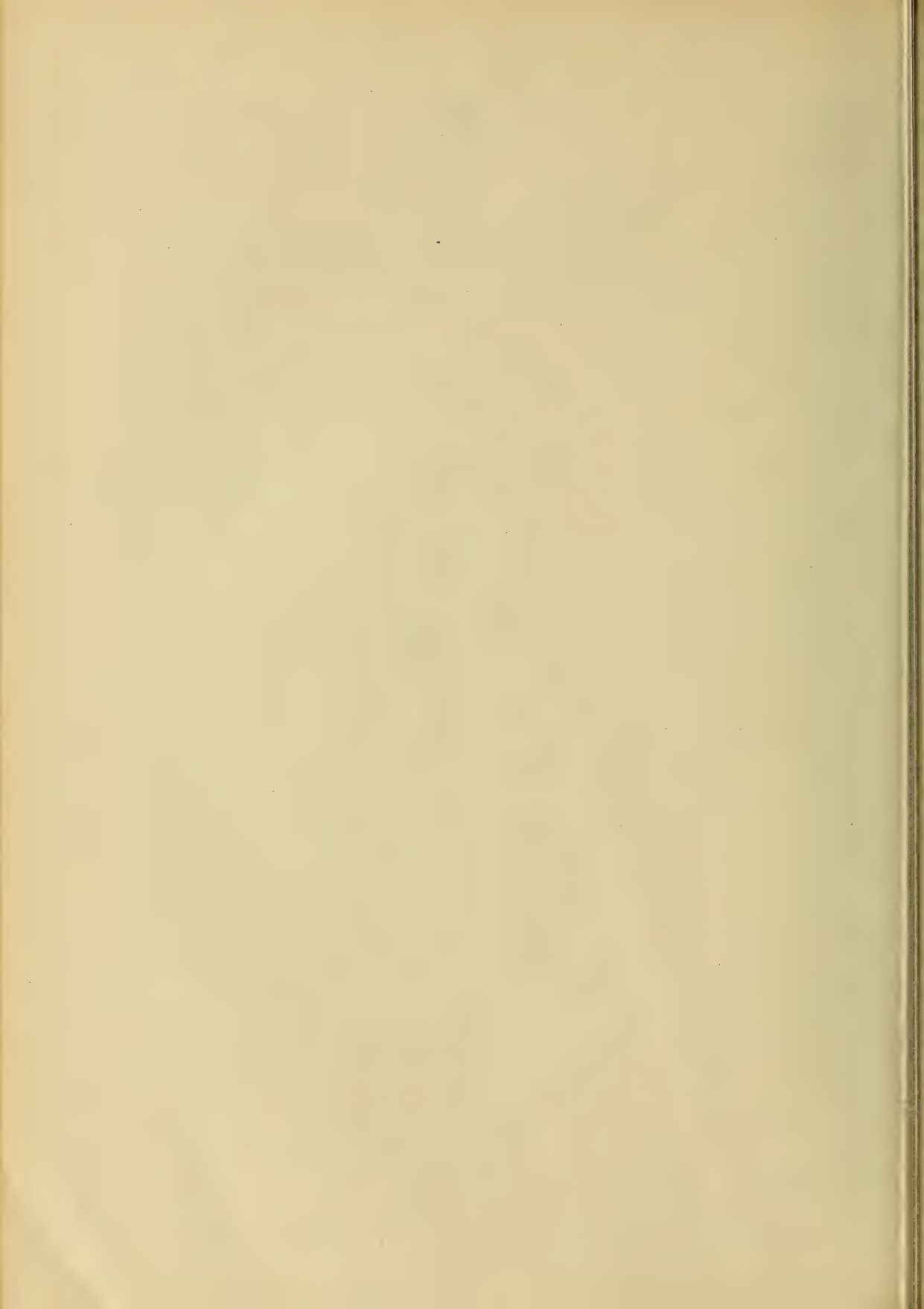
Note, in a score of you, twain or three
Brighter or darker of tinge or dye;
Some fly light as a laugh of glee,
Some fly soft as a long, low sigh:
All to the haven where each would be—
Fly.

—SWINBURNE.



PHILIPPINE YELLOW-BREASTED SUN-BIRD.
(*Cinnyris jugularis*).
Life-size.

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THE ANIMALS' FAIR.

PART II—THE FAIR.

Days and weeks of busy preparation rolled around and promptly at the appointed time the Animals' Fair opened in splendor.

A large football field had been secured for the show, and a striking sight met the eyes of curious men, women and children, who crowded through the gates on the opening day.

Two immense St. Bernard dogs had been appointed gatekeepers, and the human crowd were uncommonly respectful and subdued as they paid their entrance fee of a handful of grain or a juicy bone and passed these representatives of animal law.

The first thing to attract the eye as one entered the Fair was a large band stand which was occupied by a band of monkeys in red coats and caps, who made up in quantity what their music lacked in quality, and went through their performance with a decorum unexcelled by more musical organizations.

The monkeys found themselves more at home in their booth, which was near the grand stand, the entrance fee to which was a small sack of peanuts. Here the delighted human audience watched an unequalled show of daring rope and trapeze performances, of acrobatic feats which none but "four-handed" artists were able to accomplish, and of comical antics such as only monkeys can go through. The excited children screamed with laughter and showered peanuts upon the performers, who, following their instincts, forgot their scheduled program and joined in a wild rush and squabble over the unexpected treat. Such little episodes were soon over, however, and the entertainment and forgotten dignity were resumed together.

Next to the monkeys' booth was one occupied by geese, ducks and peacocks, and was one which deserves especial

mention. It was elaborately decorated with garlands of feather flowers dyed in all the colors of the rainbow, hung against a background of snowy white feathers. On each side stood a peacock with gorgeous tail outspread, showing to lovely effect against the white walls behind them. Pillows and cushions of softest feathers, festoons of snowy down trimmings, quills and wings and breasts for millinery purposes, feather boas, feather brushes and dusters, quill pens and quill toothpicks were displayed to greatest advantage and offered for sale for a small sum of wheat or corn.

The hogs came next with a large and elaborate display, which included strings of sausages and Dewey hams, huge glass jars of snowy lard, hams and bacon put up in fancy ways, and piles of canned pork and deviled ham. In another part of the booth were brushes of all kinds made from hog bristles, soaps manufactured from otherwise unsalable parts of hog anatomy, saddles and other leather goods made from the hides, and—in a conspicuous position—a great pile of inflated pigskin footballs, which caught the eye of every schoolboy who came near the booth.

"Young man," grunted one of the boothkeepers to a boy who was examining this pile of balls, "young man, never despise a hog nor deride him for his slowness. There is nothing more lively than a pigskin when properly inflated. It is a thing for the possession of which the representatives of the largest colleges are proud to contend, and he is the hero of the day who carries the pigskin to a winning touchdown. Why, college students will leave their books behind them, will cast aside the cultivation of their brains for the glory of chasing the pigskin over a muddy field. They will sacrifice life itself in its pur-

suit and count broken limbs and bloody noses as badges of honor. Take my advice. Buy a pigskin football and enter at once upon the path of glory."

It is hardly necessary to add that this sale, and many like it, were made during the progress of the Fair.

The booth of the wild birds was the most beautiful one in the whole display. It was gotten up to represent a forest glade, with shadowy aisles and leafy retreats. Its carpet was made of grasses and moss and ferns and flowers. A little fountain cast its waters into a tiny pool, where birds dipped their wings or quenched their thirst. Dainty nests were built in many curious ways, some hanging from the branches, others hiding beneath the grasses or sheltered by the leaves. A myriad of brilliant birds flitted through this miniature paradise, the bluebird, the redbird, the orange and black oriole, the scarlet tanager, golden canaries and many others, making up a flashing bouquet of color.

Then there were solos, and duets, and grand concerts, when thrush and lark and canary and redbird and warbler joined their voices in a great gush of melody through which ran the liquid trills and cadenzas of mocking-bird and nightingale. The quail piped his "Bob White" from the ferns and grasses; and the parrot—as clown of the occasion—imitated the human voice in comically jerky efforts.

Along the front of the booth were displayed rows of bottles filled with every imaginable kind of bug and worm which the industrious birds had gathered from orchards and fields, and which were exhibited as proof of the invaluable aid which the birds give to man.

The cattle display was next on the list—a notable one, and attractive to every man and woman. There were noble representatives from every breed of cattle, with the most beautiful, gentle-eyed calves that were ever seen. There was a tempting display of great glass jars of rich milk and yellow cream, huge cheeses and golden butter balls, daintily molded curds and glasses of whey. There was a free tank of delicious iced buttermilk, which was continually surrounded by a thirsty crowd who drank as if they had never tasted buttermilk before.

Then there were countless varieties of fancy articles made from horn and bone, pots of glue, cans of neatsfoot oil, and leather goods of every possible description.

There was dressed beef, and jerked beef, and dried beef, and potted and canned and corned and deviled and roasted. There was oxtail soup, and blood pudding, and cakes of suet, and stacks of tallow candles. There were hides tanned into soft carriage robes and rugs; there were bottles of rennet tablets; there were fancy colored bladders, and bunches of shoestrings. In short, the articles contained in this display were beyond enumeration in a short account like this.

The dogs came next with a wonderful display of fancy breeds, of trick dogs and trained dogs, of dogs little and big, varying from the shaggy Eskimo to the skinny little hairless Mexican, and from the huge St. Bernard to the tiny terrier. The Newfoundlands gave a life-saving exhibition every day, wherein monkeys dressed as people were rescued from the water or from buildings supposed to be on fire.

The St. Bernards dragged frozen traveler monkeys from snowbanks of cotton and carried them on their backs to places of safety.

Cute puppies and clumsy puppies went through their antics for the amusement of the children and rolled unconcernedly over beautiful carriage rugs which were labeled "Japanese Wolfskin."

The sheep and goats had a booth together, wherein was a marvelous display of wools and woolen goods, yarns, pelts, angora furs, kid gloves, kid shoes, rugs, carpets and blankets.

There were ropes of goats' hair which water could not destroy, and wigs which were destined to cover the heads of learned judges and barristers.

There was a wonderful red tally-ho coach, drawn by four snow-white goats driven by a monkey dressed as a coachman, which made the circuit of the Fair grounds every afternoon, while monkey passengers made the air lively and cleared the way by the loud notes of their tin horns. This exhibition set the children wild, and parents were daily

teased to buy the charming turnout for the use of their little human monkeys.

The cats had a display which met with the highest favor from their little girl visitors. Here were beautiful pussies of every kind and color, with coats as soft and shiny as silk. There were numbers of the cunningest kittens, which rolled and tumbled and went through their most graceful motions to the unending delight of the little spectators.

This booth was gaily festooned with strings of mice and rats, caught up here and there by small rabbits, gophers and moles.

There was a string band that played in this booth every afternoon to demonstrate the superiority of cat-gut strings over those made of silk or wire, as used on violins, mandolins, guitars and all other stringed instruments. They never failed to announce that their bows were strung with the finest of horsehair which had been supplied by the horses whose booth was farther down the grounds.

The horses attracted every eye and aroused much discussion among the visitors as to whether horses would ever be entirely superseded by automobiles and electric engines.

The children went into ecstasies over the Shetland ponies, and the ladies declared the Arabian horses "too lovely for anything."

Every boy who visited this booth was presented with a baseball covered with the best of horsehide leather.

But time fails me to tell of all the wonderful things which this Fair presented to the eyes of admiring men. On one point only was dissatisfaction expressed by the visitors—there was no Midway. President Monkey, when interviewed by a representative of the As-

sociated Press in regard to the omission, made the following remarkable statement:

"No, it was not a matter of oversight. The camel volunteered to bring some of his Arabs to establish the Streets of Cairo, and some of the monkeys were anxious to put in a Gay Paris display. The lions wished to bring some trained Wild Men of Borneo for a Hagenbeck show, and the snakes wanted to do jugglery. You can see that there was no lack of what misguided people call 'attractions.'

"The management discussed the Midway from every point of view, and decided that it was entirely too low grade for a first-class entertainment such as we desired to make. We felt that it would only attract a rough class of visitors, whose presence we did not desire. And so the unanimous decision was, 'We will have a good, clean, respectable show or we will have no show at all.'

"No, sir. Say emphatically in your dispatches that the Midway was intentionally omitted. Such things may do for men, but beasts will have none of them."

The Fair was in every way a success, being carried through without disturbance of any kind and coming out free of debt and with much legal tender in the treasury.

Men were so much impressed by the obligations which they owed to the animal world that there was a decided improvement in their treatment of its various representatives. While this state of affairs cannot be expected to last long, the animals have learned how to arouse such respect and have decided to make the Animal Fair an annual attraction.

MARY McCRAE CULTER.

A DAY.

In the morning the path by the river
Sent me a messenger bird,—
“I’m all by myself and lonely,
Come,” as I waked I heard.

I walked the path by the water,
Till a daisy spoke and said,
“I am so tired of shining;
Why don’t you pat my head?”

So I kissed and fondled the daisy,
Till the clover upon the lea
Said, “It is time for eating,
Spread your luncheon on me.”

But first I went to the orchard,
And gathered the fruit that hung,
Before I answered the green-sward,
Where the clovery grasses swung.

Then the rocks on the hill-side called me,
And the flowers beside the way,
And I talked with the oaks and maples
Till Night was threatening Day.

Then I knelt at the foot of the sunset,
And laid thereon my prayer,
And the angels, star-crowned, hurried
To carry it up the stair.

And this was the plea I put there:
Make me so pure and good
That I shall be worthy the friendship
Of river, and field, and wood.

LUCIA BELLE COOK.



THE GREAT GRAY OWL.

(*Scotiaptex cinerea*.)

Through Mossy and viny vistas
Soaked ever with deepest shade,
Dimly the dull owl stared and stared
From his bosky ambushade.

—James Whitcomb Riley, "A Vision of Summer."

The Great Gray or Cinereous Owl is the largest of the American owls. The appearance of great size, however, is due to its thick and fluffy plumage. Its body is very small being only slightly larger than those of the barred or hoot owl. The eggs are also said to be small when compared with the size of the bird.

The range of this handsome Owl is practically confined to the most northern regions of North America, where it breeds from the latitude of Hudson Bay northward as far as forests extend. In the winter it is more or less migratory, the distance that it travels southward seeming to depend solely on the severity of the season. It has been captured in several of the northern United States, from the Atlantic to the Pacific Oceans. It is related in "The Hawks and Owls of the United States," that "Dr. Dall considers it a stupid bird and states that sometimes it may be caught in the hands. Its great predilection for thick woods, in which it dwells doubtless to the very limit of trees, prevents it from being an inhabitant of the barren grounds or other open country in the north. It is crepuscular or slightly nocturnal in the southern parts of its range, but in the high north it pursues its prey in the daytime. In the latter region, where the sun never passes below the horizon in summer, it is

undoubtedly necessity and not choice that prompts it to be abroad in the daylight." Its yellow eyes are very small and would indicate day-hunting proclivities.

Dr. A. K. Fisher states that its "food seems to consist principally of hares, mice and others of the smaller mammals as well as small birds." Dr. W. H. Dall has taken "no less than thirteen skulls and other remains of red-poll linnets from the crop of a single bird." Specimens in captivity are reported to have relished a diet of fish.

Its nest is described as a coarse structure built in the taller trees and composed of twigs and lined with moss and feathers. The note of this great bird is said to be "a tremulous, vibrating sound, somewhat resembling that of the screech owl."

The Great Gray Owl is also known as the Great Sooty Owl and the Spectral Owl. Its generic title, *Scotiaptex*, is from two Greek words, one meaning darkness and the other to frighten.

The dignified mein of this great bird may well have been the inspiration that caused the poet to say,

Art thou, grave bird! so wondrous wise indeed?

Speak freely, without fear of jest or gibe—
What is thy moral and religious creed?

And what the metaphysics of thy tribe?

MY SUMMER ACQUAINTANCES.

I spent last summer in a quiet, old country place where my only near neighbors were the birds, rabbits and squirrels, but I formed many pleasant acquaintances among these, and the dearest among them was a pair of little goldfinches that built their nest in the topmost bough of a young pear tree that overshadowed the porch where I spent a great part of my time.

I did not discover the nest until the little ones were already hatched. The early June days had been cloudy and cool and had kept me shut in, so I did not have the pleasure of watching my little neighbors build their home. The nest was so carefully hidden among the leafy boughs that no one would have suspected it was there. My attention was first arrested to it one morning by the faint cries of young birds, and on looking up I saw a little goldfinch perched on the topmost bough of the pear tree, bending fondly over what I knew must be the nest. She lingered but a moment and then darted away to an apple tree near by, where I discovered her mate. He was a tiny little fellow, not much larger than she, but his jacket seemed a brighter yellow and his head and the tips of his wings a glossier black. They rested a moment, seemingly in earnest conversation, then both darted away to a thicket of tall grass and weeds that grew along the banks of a creek that ran near by.

It was but a few moments until the little mother was back again and in her tiny yellow beak I saw the dainty morsel she was carrying to the hungry little family.

All day long, back and forth, from the nest to the thicket she flew, but the hungry little ones never seemed to be satisfied. The father bird did not come very often, and I wondered if he was spending his time in idleness or seeking pleas-

ure for himself, while the poor, little mother was working so arduously for the support of the family. But I hardly think this was the case, for he always came from this same thicket and they always seemed confidential and happy. He would rest himself daintily on some branch overlooking the nest, and with many quips and turns watch the mother as she fed the hungry little ones. Sometimes he would bring food himself and then they would fly away together. I think he was searching for the food and probably gathering it, for sometimes Mistress Goldfinch would be gone but a moment until she would return with the food.

Every day the same scenes were repeated, only the cries of the little ones grew more clamorous, and I could see their gaping mouths as they stretched their necks, each one trying to convince the mother that he was the hungriest bird in the nest. The little mother was always patient and loving—what a lesson to us who so often chafe and fret under the petty trials of every day life! As the days went by the young birds grew bolder and I could see their little yellow bodies as they fluttered and pushed themselves near the edge of the nest, and I knew that there would soon be an empty nest in the pear tree.

It was one afternoon, about ten days after I discovered the nest, that the lessons in flying began. The father and mother would fly from the nest to some twig a few feet from the nest and then back again, then from twig to twig with many little chirps as if saying, "Don't you see how easy it is? All you have to do is to try." Then the boldest little fellow would perch himself on the edge of the nest, flutter his little wings, sit still for a minute, and then roll back into the nest as if it was too much for him. Then the father and mother would re-

peat the lesson, but all in vain that afternoon, so they finally gave up and went in search of food. The next morning the lessons began in earnest, and then the bold little youngster, who had made so many pretensions the afternoon before, grew bolder and with a nervous little flutter and a sidewise plunge landed on a twig some few feet below the nest. He rested a few moments and then, with a few encouraging chirps from his parents, tried it again with better results.

One by one the other timid fledglings were induced to follow him. There were many tumbles and falls, but the little mother was always there to encourage and help, and by afternoon the little home was deserted. They staid a few days in the trees near by and then flew away to seek new homes, and all that was left to remind me of the happy family was the empty nest in the leafy bough.

ELLEN HAMPTON DICK.

THE BIRD OF PEACE.

The dove, bearing an olive branch, is, in Christian art, an emblem of peace. The early churches used vessels of precious metal fashioned in the shape of a dove in which to place the holy sacrament, no doubt because the Holy Spirit descended upon Christ in the form of a dove.

Noah's dove, of still older fame, was immortalized as a constellation in the sky.

The plaintive "coo" of the dove has also added to the sentiment about it. The poets delight to refer to it as a sorrowful bird. One of them says:

"Oft I heard the tender dove
In fiery woodlands making moan."

The dove, "most musical, most melancholy," is the singer whom the mocking bird does not attempt to imitate.

There is a Philippine legend that of all birds only the dove understands the human tongue. The pigeon tribe is noted for its friendliness to man—

"Of all the feathered race
Alone it looks unscared on the human face."

The word dove means "diver" and refers to the way this bird ducks its head.

It has purposely designed "wing whistles" and often strikes the wings together when beginning to fly.

The broken wing dodge it often practices tends to prove that its ancestors built on the ground.

The nest of the dove has no architectural beauty and it is not a good housekeeper, and is something of a gad-about. Indeed, doves are not so gentle in character as they are usually portrayed. They are sometimes impolite to each other and occasionally indulge in a family "scrap." But as nothing in this world is quite perfect, the dove with its fine form, and beautiful quaker-like garb, may be accepted as one of the most interesting of our birds.

BELLE PAXSON DRURY.

THE GREEN-CRESTED FLYCATCHER.

(*Empidonax virescens*.)

The Green-crested or Acadian Flycatcher is a frequent summer resident in the eastern United States, and through the valley of the Mississippi river it migrates as far northward as Manitoba, where it is said to be quite common.

This bird exhibits no haste in its northward spring journey, for it is one of the latest species to arrive on its breeding grounds in the higher latitudes and as winter approaches, it leaves the United States entirely and winters in Mexico, Central America and northern South America.

If we would make the acquaintance of the Green-crested Flycatcher, we must seek it in woodlands in the vicinity of some stream or other body of water. Its favorite haunts are "deep, shady, second-growth hardwood forests, on rather elevated ground, especially beech woods with little undergrowth, or bottom lands not subject to periodical overflow." It is not an over shy bird, yet it is rather difficult to find, for its colors are in perfect harmony with its surroundings as it passes from tree to tree through the dark foliage of the lower limbs. So perfect is this color-harmony that Major Charles Bendire said, "I have several times failed to detect the bird when I was perfectly certain it was within twenty feet of me," and Neltje Blanchan likens its movements to "a leaf that is being blown about, touched by the sunshine flittering through the trees, and partly shaded by the young foliage casting its first shadows."

Like its sister flycatchers the Green-crested is not a good natured bird and will even quarrel with individuals of its own species. Even its voice is fretful, especially when from its perch it is waiting for an insect to pass by. It seldom

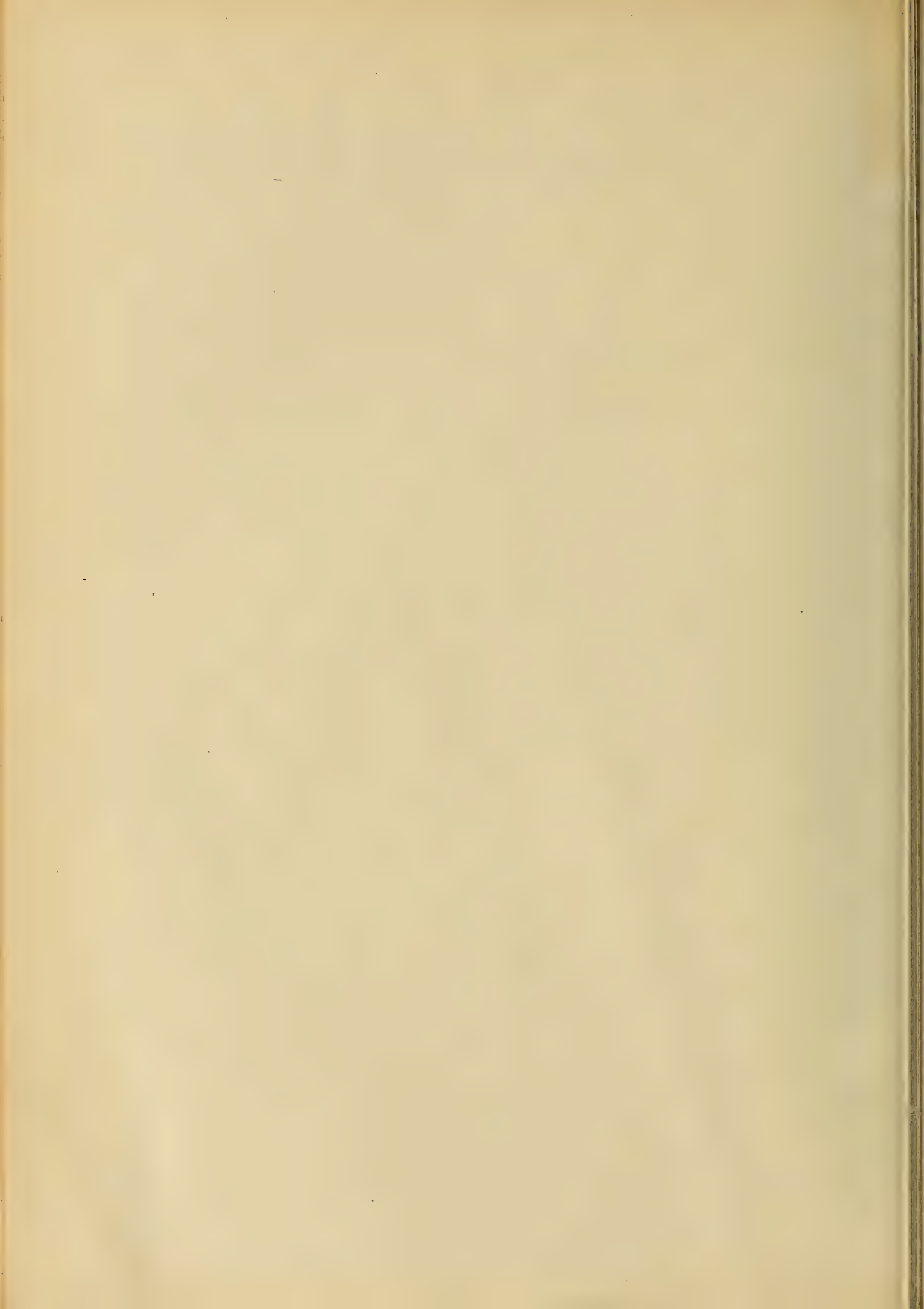
perches higher than from fifteen to twenty feet from the ground, and while standing constantly twitches its tail and frequently utters a note that Mr. Chapman describes as a single spee or peet.

It is a beneficial bird, for its food consists of insects except in the fall when it feeds to a limited extent on wild berries. It will occasionally visit orchards where it has learned there may be found a plentiful supply of food to its liking. When an insect is sighted, like the other flycatchers, except that it chooses a low rather than a high perch from which to watch, it flies outward and with an upward sweep seldom fails to catch its prey in its open bill, which is suddenly closed with a notably loud click that seems like an expression of satisfaction over the result of its efforts.

The drooping branches of several kinds of trees and shrubs are selected by the Green-crested Flycatchers as suitable sites for their unpretentious homes. The nests are semipensil, being attached by the rim to the fork of a small limb or to two parallel limbs. They are shallow and so loosely constructed that frequently the eggs may be seen from the underside. As this Flycatcher breeds nearly throughout its range, the materials used in the construction of the nests varies greatly. In southern states where Spanish moss is common it is one of the chief constituents of the nest. In more northern district, stems of plants, small roots and fibrous materials are used. These are loosely woven with blades of grass, dry flowers and the catkins of the willow. Not infrequently the hanging catkins, decayed fibres and the loose ends of stems and blades of grass give an untidy appearance to the home of this useful and interesting bird.



GREEN-CRESTED FLYCATCHER.
(*Empidonax virescens*).
Life-size.



CHARACTER IN BIRDS.

In a delightful article called "Character in Birds," Mr. Torrey gives many instances of bird traits that show distinct differences of nature in various species, and which lead one to recall others that have fallen under observation. Mr. Torrey does not mention, for instance, a peculiarity of the redeyed vireo, which is as marked as its persistent and rather tiresome note; that is, its almost intolerable curiosity and fussiness, qualities which it carries to such an extreme that they become absolutely comic. I think I have never seated myself to watch the nest of any bird, that a redeyed vireo has not appeared on the scene and scolded me; and the moment a bird utters a cry of alarm a redeyed vireo is sure to appear with his fretful air of "Oh, dear, what is the matter now?" ready and willing to take a hand in any rows that may be going and quite sure to make more fuss than the really agrieved party; and oddly enough seeming, in one instance at least, even to resent the noise that the troubled bird was making, for one day when an indigo bird, that I had tormented by watching its nest, had chattered and chattered until he had brought every bird in the neighborhood to see what was the matter, a redeyed vireo, after prancing around for a time, flew at the distracted indigo bird with a very cross squawk, which said as plainly as words, "Do be quiet, can't you?"

The vireo's action in this case was in marked contrast to that of a thistle bird which came up warbling and gave me a careless glance, and then flew away still singing, but as the noise continued he came back presently and perching on a twig above me, bent his bright head to look at me, saying, "swee-et" in a long-drawn, inquiring way, with a little break in his voice which was singularly endearing, as are all the ways of these charming creatures; after inspecting me

again he disappeared, but at a renewed outcry from the indigo birds he came warbling back once more. This time he paid little attention to me, having apparently satisfied his curiosity on that point on his former visit; but seeming to divine that there must be some reason why the indigo bird should make so much fuss, he began to examine the tree which held the nest. Suddenly he discovered the nest, and after a start which expressed surprise and interest, he flew up and hovered over it for an instant and then flitted away, warbling. Red-eyed vireos seem to be always restless and irritable, and perfectly sure that you mean to do them or their nests some harm, and it is sometimes quite distracting to go into a certain piece of woods where they are very plentiful; the moment you enter it they begin their distressful "please, please," uttered half pleadingly and half crossly. One is sure they must be near a vireo's nest, yet may pass beneath it day after day, and though looking for it fail to find it, if there are no young ones, so skillful are they in concealing their beautiful nests. These are among the most fascinating of bird cradles, particularly in this piece of woods where there are many birch trees, from which the vireo obtains fine, silky shreds of the beautifully tinted bark and weaves into the nest with the most exquisite effect, giving unusual delicacy of color and texture. The redeye has also the most remarkable habit of arranging the nest so that it shall be quite hidden by the leaves, often with one leaf which serves as a roof and protects the young or eggs from sun and rain; and if they would only keep quiet they would usually be quite safe, but instead, the moment any one appears they make so much noise that attention is attracted to them at once, and you begin naturally to look for the cause. Even then it may be some time before the nest

is discovered, as there are usually only one or two points from which a view of it can be obtained and a single leaf will sometimes quite conceal it. Possibly there are circumstances in the life of a redeyed vireo which, if known, would account for his irritability and egotistical belief that all eyes are upon him with evil intent; but our eyes are dull, and one could wish at times that his trials, whatever they may be, might sweeten his temper. I do know, at least, that redeyed vireos are much tormented by that plague of bird life, the cowbunting, which delights in laying her eggs in the redeye's nest; and nowhere could they be placed where they would cause more discomfort, for the vireo's nest is a delicate structure and none too large for its own nestlings. I think the cowbird often injures the nest when she lays her egg, as she probably gets in and out of it with more or less haste, being hurried by the agrieved owners, for not only do the young vireos fall out of the nest, but even the interloping cowbird sometimes falls out before he is able to fly and meets his death by a tumble before he is prepared to leave the nest.

One summer I was watching a hawk's nest and was always greeted by the angry cries of the redeyed vireos, who never ceased to scold at me and the hawk, and so upset a nervous, but well meaning at least, flycatcher that it, too, joined in the abuse. Sometimes when the hawk flew away the vireos would follow him for quite a distance through the trees, scolding in the most dismal manner and showing little fear of the great, fierce creature, who they seemed to know could not catch them among the thick branches of the trees. But one day I was amazed to see a redeyed vireo actually on the lower part of the hawk's nest. To be sure the hawk was absent, but he had a swift and silent way of returning that made it seem a rather dangerous bit of bravado. The redeye often has a most uncomfortable habit not only of quarreling with any neighbor that will quarrel but also of squabbling with each other even during the time that they are engaged in caring for the young. One summer a pair of them, having a nest in a tree near the house, were so quar-

relsome and kept up such a persistent clatter that they became really tiresome. It must be admitted, however, that in this particular case they had cause for being irritable, for they were trying to bring up a cowbunting besides their own family, and perhaps each thought the other was to blame for the misfortune. Indeed it took little imagination to think that their perpetual squabbles were caused by mutual recriminations in regard to their voracious foster nestling. Poor vireos! They fought with each other and everyone else, but particularly with a phoebe which had a nest near by, and was also tired and fretful from overwork and perhaps fond of a row himself, for he had an aggravating habit of coming into a little tree just below the vireos' nest and twitching his tail in the rather inane manner peculiar to phoebes, and that was all that was needed to throw the vireos into a perfect fume, and they responded instantly, flying at him wrathfully and were promptly met by a kindred spirit. It was a most unreasonable business, as neither wanted anything that the other had, and seemed to prove that all they needed was an excuse to show their ill temper. These same vireos had a very real cause for rage and fear in the presence of the red squirrels, and they never failed to pursue and scold one the moment it appeared. Their whole life seemed so uncomfortable and their perpetual fussing was so wearisome that it was difficult to feel proper sympathy for them when their affairs ended tragically. But they were most devoted parents, and as such must have credit, though their domestic arrangements seemed squalidly inharmonious and were so pronounced that no one living in the vicinity could help knowing all about them.

Thistle birds, like the vireos, are very apt to appear in response to any call of alarm or annoyance from their neighbors, but their interest seems to have a sweet and kindly spirit, very different to the acidulated attitude of the redeyed vireo. In truth the most marked characteristic of these little beauties is a peculiar loveliness and their gentle cheeriness makes them ideal companions. They have a delightful habit of appearing in

June in flocks and congregating on the white sandy beach of the lake, reminding one of the clouds of yellow butterflies that come to the same place at certain times of the year. At this time the male thistle bird sings in a perfect ecstasy of joy and love; but of all their attractive qualities none is so endearing as a habit they have late in the fall of singing as they fly high up, mere specks, their exquisite ethereal notes drifting down sometimes with the first snowflakes as they go joyfully to meet the storm and the night.

Scarlet tanagers are often hardly more agreeable in their marital relations than the redeyed vireos, and though no doubt they vary greatly in this respect, those that I have noticed showed a decided coldness, occasionally varied by marked crossness. And the wooing of a scarlet tanager is sometimes most amusing, for the female is, or pretends to be, amazingly indifferent and it must take a courageous lover to persist in spite of her severe manner, but male tanagers are gifted with persistence and do not seem to go unmated, and they make most devoted parents, though it would hardly have been expected of them after their seeming indifference during the incubating. One pair of tanagers that had a nest close to the house, and so could be constantly watched, were never on really friendly terms with each other, sometimes quarreling outright, and only seeking each other's society when some danger seemed to threaten their young ones. Then the female seemed glad of the presence of her mate. Young scarlet tanagers are very confiding and gentle in their ways, and do not seem to have much fear of man here. There are always several of these pretty creatures flitting about in the evergreens near the house at the season when they are old enough to begin to take care of themselves, and they often alight on the hammock ropes or sit on the branches quite near me, looking on with bright, interested eyes. They have little playful ways that are rather unusual in a young bird and remind one of kittens. Sometimes when a shred of the arbor vitæ bark hangs down above them they will play with it, using their beak as a kitten does its paws, and their

voices have an almost plaintive sweetness that adds greatly to their attractions.

Next perhaps in fussiness to a redeyed vireo may be counted the phœbe; and there does not appear to be quite so much reason for the phœbe's unhappy frame of mind, for on the whole their nests seem rather safer than those of most birds, built as they so often are in sheltered places about the houses and barns. But though the nests escape the young phœbes are very liable to come to grief, and their elders nearly wear themselves out when the young first leave the nest, which they often choose to do on a very stormy day. Phœbes are pugnacious, too, and carry on feuds among themselves year after year, those on the east side of the house always quarreling with those on the west side, and when they first come back in the spring there are frequent conflicts, noisily carried on in midair, which continue at intervals until both parties are too busy with their nests and young to attend to other things, though even then, if an idle moment occurs, they promptly take advantage of it to have a brush with each other. There never seems to be any particular advantage gained on either side; so dismal as they seem about it all they no doubt rather enjoy the excitement afforded by these little interludes.

Young phœbes show none of these aggressive qualities, and have the most gentle and attractive manners and a peculiar air of innocence that is most captivating. If the parent phœbe brings up an insect all the nestlings, who may be sitting in a row on a branch, wave their soft wings and squeak. The parent inspects them for a moment and then feeds one. The instant the old bird has decided which shall be fed the rest subside and wait quietly until her return. There is no pushing and crowding or following the parent.

The slate colored junco is another of the essentially cheerful spirits, yet has a remarkable sedateness and self-possession, such as one is sometimes surprised to find in people of particularly quiet and gentle dispositions. And he has one habit that has made him very dear, for he always appears in the fall and remains

until quite late in the season. During this time he haunts the evergreen trees in front of the house, coming back there every evening to sleep or to seek shelter from a storm, announcing his arrival with low twitterings and restless games of play. If one goes under the evergreens after dark and gently shakes a branch there will be a slight fluttering of wings and disturbed sleepy notes from the juncos. They love to feed in the drive which runs in front of the house and in the thickets of rose bushes that creep up to the windows, coming close to the veranda and eating any crumbs that are thrown out for them, and even on the wettest day looking trim and contented and bringing with them a sense of companionship which can be only appreciated by those who have lived much alone, when the different creatures come to be better known than they can be where there are people constantly distracting the attention.

The Kentucky cardinal, though I have known it but slightly, made a very vivid impression because of its gentle pensiveness. I once spent a few months in a little village in Florida and flocks of these exquisite creatures appeared from time to time in our garden and in differ-

ent places that we visited. They were always rather tame, coming near us and feeding on the ground, uttering plaintive notes that reminded me of the cedar bird and which suggested a much smaller bird. The cardinal's manner had something so sensitive and touching about it that it appealed to me at once and made the lovely strangers as dear as though they had been known a lifetime. They were never hurried or excited and I never heard a cross note or saw the slightest indication of any friction among them; but their whole manner was colored with sadness—a quiet, unobtrusive sadness. Even their song was tinged with it and it was curious how these brilliant creatures left on the mind a sense of “going quietly” and being subdued, which made them the greatest contrast to the absurd redwinged black birds with whom they often shared the umbrella tree.

Hundreds of other instances of bird character crowd into the mind, as one writes, and the air seems again full of airy creatures each with his or her small personality standing out from all the rest in bright contrast, some grave, some gay, some cross, and others kind, but all beautiful and full of interest.

LOUISE CLAUDE.

Frowning, the owl in the oak complained him
Sore, that the song of the robin restrained him
Wrongly of slumber, rudely of rest.
“From the north, from the east, from the south and the west,
Woodland, wheat-field, corn-field, clover,
Over and over and over and over,
Five o'clock, ten o'clock, twelve or seven,
Nothing but robin-songs heard under heaven:
How can we sleep?”

—Sidney Lanier, “Owl Against Robin.”



THE LOUISIANA WATER-THRUSH.

Seiurus motacilla.

The Louisiana Water-thrush is a woodland bird with quite an extended range, which includes all of the eastern United States west to the plains and north to Massachusetts, Michigan and Minnesota. It winters in the region of the Gulf of Mexico and southward into South America. This bird seems to be burdened with long names, for it is also called the Large-billed Water-thrush and Large-billed Wagtail Warbler. The last name is quite appropriate for it, as well as the other water-thrushes, are warblers rather than thrushes. The name Wagtail well describes one of its most striking characteristics. It is a dignified bird, and as it moves with stately steps along the limb of a tree, or a log upon the ground, the tail moves up and down in rhythm with its step. It is a shy bird and its "never-ceasing alertness suggests the watchfulness of the savage." When discovered and that will not be until it already knows of the intruder's presence, it sounds an alarm and quickly flies to some distant perch where it watches every movement of the invader, its body constantly teetering as if with suppressed excitement.

When seeking a nesting site the Water-thrush shows a partiality for wild and favorable localities near a stream of water, especially "where dashing brooks leap down wooded hillsides." At times, however, it will select a retired spot on the wooded banks of a lowland stream or of a lake. The nest is built in some secure retreat among the roots of an overturned tree, in the cavity of an old log or stump, or in the moss under a bank. An impenetrable thicket with a rank growth of ferns and moss, is the usual desideratum when seeking a place to locate its home.

The nests are bulky and constructed with dead leaves, often partly decayed, which are obtained from the muddy

banks and with the mud still adhering to them. These, with twigs and rootlets, are laid together and when the mud dries all are cemented into a compact mass which forms the wall of the nest. This is lined with fine grasses, small roots, bark fibers and feathers or hair. The nest is so similar in color to that of its environment that it is not easily detected.

The Louisiana Water-thrush seldom utters its interesting song when on the ground, but from some higher perch or when flying. Audubon thought its song was equal to that of the European nightingale; that its notes were as powerful and mellow and not infrequently as varied. Dr. Ridgway says, "This may be true of the ecstatic love-song, heard on rare occasions, and uttered as the singer floats in perfect abandon of joy, with spread tail and fluttering wings, but it can hardly be true of the ordinary song, which, although rich, sweet and penetrating, and almost startling in the first impression it creates, is soon finished and the pleasing effect is somewhat transient. It cannot be denied, however, that its song is one of the richest to be heard in our forests."

Another writer speaks of its song as "a beautiful, wild, wayward effort," and Mr. Chapman says, "As a songster the Water-thrush is without a rival. His song is not to be compared with the clear-voiced carol of the rose-breasted grosbeak, the plaintive chant of the field sparrow, or the hymnlike melody of the true thrushes; it is of a different kind. It is the untamable spirit of the bird rendered in music. There is an almost fierce wildness in its ringing notes. On rare occasions he is inspired to voice his passion in a flight-song, which so far exceeds his usual performance that even the memory of it is thrilling."

SOME DOGS.

When I was a small boy I lived with my parents in my grandfather's home. Here was grandfather's large dog Rouse. He was the constant companion of my uncle in his work on the farm. His great desire was to carry something in his mouth when the team started for the field. He was often given a singletree, with which he marched along, showing evident satisfaction. One day he concluded to cut across a field instead of going around the road. The fence was a high rail one and, burdened with the weight of the heavy singletree, he could not jump over. After several vain attempts he dropped his load, stood looking up and down the road. Then looking at the singletree for a moment picked it up and put it through between the rails. He then jumped over the fence, gathered up the singletree and trotted on.

One thing he absolutely refused to carry was an iron wedge unless it was put in a basket. On one occasion this same uncle lost the lash of the whip he was using in driving a yoke of oxen. He had another at the house, but it was nearly a mile distant. He wrote his want on a slip of paper and giving it to Rouse said, "Take this to mother." He was soon scratching at the kitchen door. When the door was opened he dropped the note on the floor, was given the whip lash and hurried away to the field.

A certain dog belonged to a doctor. He often trotted along under the buggy when the doctor went to call on his patients. On one occasion the doctor rode horseback and hurriedly threw the bridle rein over a hitching post where the visit was made. The horse threw up his head, the bridle rein was freed from the post and the horse started down the road. The dog saw the move and started after him. After some little difficulty he caught the dangling rein, brought the horse back to the post and held him there until the doctor came out.

On another occasion a horse was tied to a post of the porch at the doctor's house. He got restless and was soon standing with fore feet on the porch. The dog saw it and, catching him by the tail, pulled until he backed down and stood on the ground.

There is a big shepherd dog not far from where I live that watches for the evening train. As soon as it appears he runs to a certain place beside the track, where the mail clerk throws him a bundle of papers. He never fails to be at his post or on the way.

A dog who was utilized to run a dog power churn at last grew tired and resorted to various schemes to get out of the work. Just after the churn had been made ready one day the lady heard the vigorous bawling of a calf and looking out she saw the dog trying hard to get a calf into position to do the churning. After this it was necessary to tie his dogship the night before if he was to be used next day.

An Iowa dog who had suffered much from firecrackers on the Fourth always disappeared soon after midnight of the third at the first shot of an anvil or cannon cracker. He spent the day in the country far from town and never returned until the noise had ceased.

A friend who was a photographer had a large Newfoundland dog who had a great deal of curiosity about his make-up, as well as much sense. His face was always the first to appear at the village postoffice window when the mail was opened. The master was an oldtime photographer when stronger water ammonia was much used in the preparation of paper. There was an assistant in the gallery who liked to tease the dog and knowing the trait of desiring to investigate every box or bottle that was opened, played many tricks on him, but none of them seemed to cure him or to lessen this desire until he got a good full whiff of stronger ammonia, which laid him

full length on the floor and made him less anxious to look into everything with his nose.

His master had a book for the butcher and a different one for his account with the grocer. When meat or groceries were wanted it was only necessary to give him a book in which had been written the articles desired and a basket and away he went. He knew where to go by the color of the book. Often in coming

home with meat he was set upon by other dogs who tried to rob him. One day a large hound tried several times to get the meat, but was kept away by very significant growls. Becoming more determined he made a final dash, when Newfoundland set the basket down and no hound ever got a sounder thrashing. Then with head and tail held high the basket was carried home in triumph.

ALVIN M. HENDEE.

PECULIAR MEXICAN BREAD.

Among some curios lately brought from Mexico, is a cake made of the eggs of water beetles.

This odd sort of edible resembles, outwardly, a biscuit made of coarse brown or oatmeal flour. In taste it is not unlike the same wholesome article of diet. As a matter of fact, water beetles hold a high place in the domestic economy of the poorer natives of Mexico.

Their collection is, therefore, quite an industry, and one in which the Indians, particularly, are adepts.

This is the plan of operation: Reeds are cut and placed along the margins of

lakes and ponds. Soon these reeds are covered by an incredible number of eggs so minute that it is necessary to shake them on a cloth to gather them.

These eggs are then put in bags and pounded.

The result is a coarse flour, which may be cooked in a great variety of ways. All highly nutritious and stimulating. A vast number of beetles are also collected and used as food for chickens, but notwithstanding this immense demand, the supply suffers no appreciable diminution.

LOUISE JAMISON.

NATURE'S GLORY.

Oh, golden days with cloudless skies—
When forests flame with gorgeous dyes;
A touch of wine seems in the air,
Fields are brown—pastures bare.
Deep purple wraps the distant hills,
Gray shadows fall upon the rills;—
Thro' rustling corn the zephyrs sigh,
In grief to see fair summer die.
These are days of Nature's glory,
Sung in song, and told in story

—J. MAYNE BALTIMORE.

LAPIS LAZULI, AMBER AND MALICHITE.

LAPIS LAZULI.

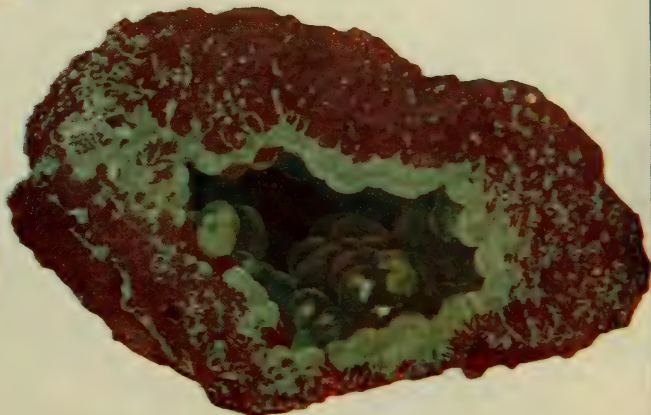
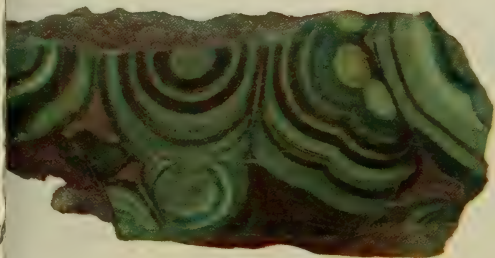
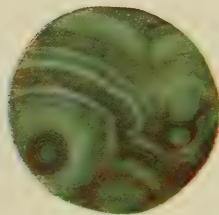
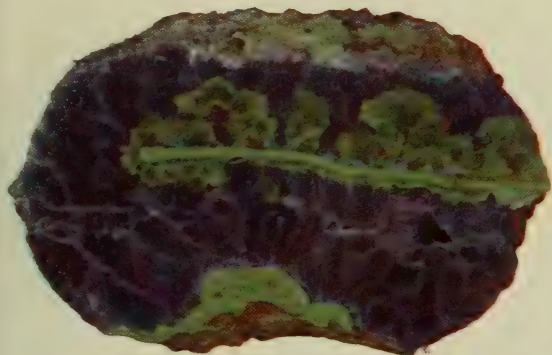
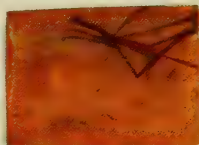
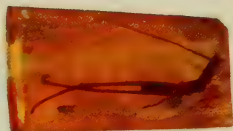
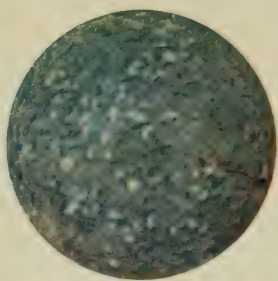
This stone was the sapphire of the Greeks, Romans and Hebrew Scriptures. Pliny likened it to the blue sky adorned with stars. Large quantities of worked pieces of it are found in early Egyptian tombs, and the Chinese have long held it in high esteem. Marco Polo visited Asiatic mines of the mineral in 1271 A. D., and these had doubtless been worked for a long time previous. Besides its value as a stone it was in former times used as a blue pigment, giving the ultramarine blue. In modern times not only has the esteem in which the stone is held for ornamental purposes declined but the mineral can be artificially made so as to give the desired blue color for paints and thus the use of the natural lapis lazuli has greatly diminished. It is still however carved to make vases, small dishes, brooches and ring stones and is used to a considerable extent for mosaic work. When, also, pieces of sufficient size and of a uniform color can be found, large carved objects may be made which command a high price.

The stone known as lapis lazuli as it occurs in nature is not a single mineral but a mixture of several, among which are calcite, pyrite and pyroxene. From these however it is possible to separate a mineral of uniform composition sometimes crystallized in dodecahedrons which is probably the essential ingredient of the stone. This mineral is known as lazulite and in composition is a silicate of soda and alumina with a small quantity of sodium sulphide. It is by making a substance of this composition that the artificial ultramarine is produced. The artificial is said to be as good as the natural for a pigment and can be produced for a three-hundredth part of the cost. The natural lapis lazuli has a hardness of 5-6 and a specific

gravity about like that of quartz. It is quite opaque. In color it is blue, varying from the prized ultramarine to paler, and at times is of a greenish shade. It is said the pale colored portions can be turned darker by heating to a red heat. When the variety from Chile is heated in the dark it emits a phosphorescent green light. The stone in Nature is often flecked with white calcite. Portions so affected are not considered as valuable as the uniform blue. Grains of pyrite are also usually scattered through the stone giving the "starry" effect referred to by Pliny.

Lapis lazuli usually occurs in limestone but in connection with granite so that it seems to be a product of the eruption of the granite through the limestone. The lapis lazuli of best quality comes from Asia, the mines being at Badakhschan in the northeastern part of Afghanistan on the Oxus river. The mining is done by building great fires on the rocks and throwing water on them to break them. The yield at present is small, not over 1,500 pounds a year being obtained. The lapis lazuli from these mines is distributed all over Asia, going chiefly to China and Russia. The price realized is said to be from \$50 to \$75 per pound. Lapis lazuli of poorer quality comes from a region at the western end of Lake Baikal in Siberia. The only other important locality is in the Andes Mts. of Chile near the boundary of the Argentine Republic. This material is not much used at the present time on account of its poor quality but it was employed by the Incas for decorative purposes. One mass 24x12x8 in., doubtless from this locality is now in the Field Columbian Museum, and was found in a Peruvian grave. It is one of the largest masses of lapis lazuli known.

The walls of a palace at Zarskoe-Selo, Russia, built by order of Catherine II are entirely lined with slabs of lapis

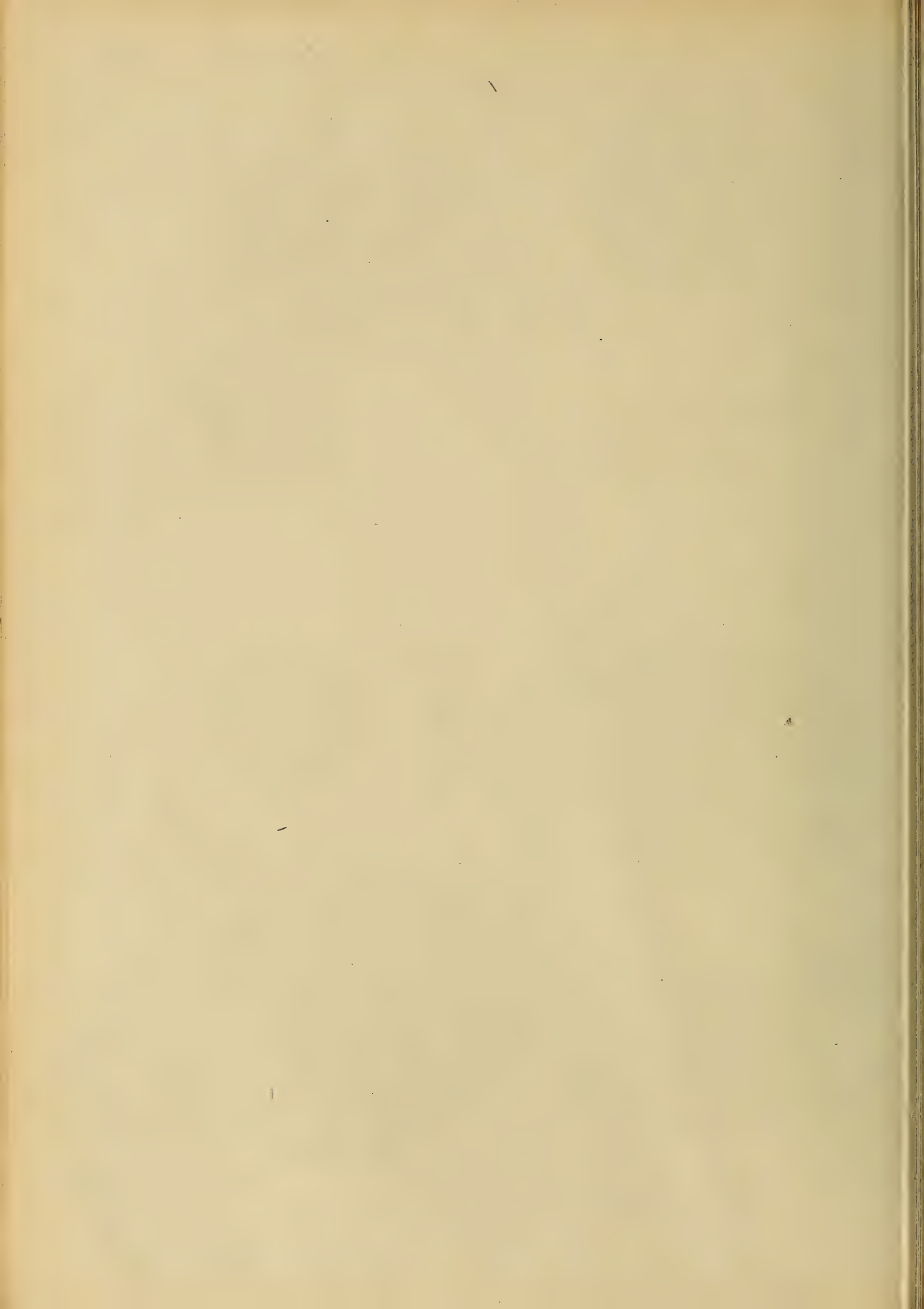


LOANED BY FOOTE MINERAL CO.

AMBER, MALACHITE, LAPIS-LAZULI AND AZURITE.

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Lapis-lazuli, polished (Siberia).
 Malachite and Azurite, polished (Arizona).
 Malachite, polished (Austria).
 Amber, polished, showing insects enclosed (Coast of Baltic Sea).
 Amber, rolled pebble (Coast of Baltic Sea).
 Malachite, polished (Ural Mountains).
 Malachite (Arizona).



lazuli and amber. Pulverized the stone was used as a tonic and purgative by the Greeks and Romans. The name lapis lazuli means blue stone. Armenian stone is another term by which the stone is known in trade.

AMBER.

Few minerals have been longer in favor for ornamental purposes than amber. Among remains of the earliest peoples such as the Egyptians and Cave-dwellers of Switzerland it is found in carved masses indicating that it was highly prized. The Phenicians are said to have sailed to the Baltic for the purpose of procuring it, while the Greeks' knowledge of it is indelibly preserved in our word electricity derived from their word *elektron*. The high favor in which the ancients regarded amber has hardly endured however to the present time. Were it not for its use for mouthpieces of pipes and other smokers' articles and the occasional amber necklace to be seen, amber would hardly be known among the present generation in our country.

Amber is a fossil gum of trees of the genus *Pinus* and is thus a vegetable rather than mineral product. In color it is yellow, varying to reddish, brownish and whitish. Its hardness is 2 to 2.5, it being slightly harder than gypsum and softer than calcite. It cannot be scratched by the finger nail but easily and deeply with a knife. It is also brittle. Its specific gravity is scarcely greater than that of water, the exact specific weight being 1.050—1.096. It thus almost floats in water, especially sea water. It is transparent to translucent. On being heated it becomes soft at 150 degrees and at 250 degrees to 300 degrees melts. It also burns readily and at a low temperature, a fact which has given rise to the name of *bernstein* by which the Germans know it, and to one of the Roman names for it, *lapis ardens*. Rubbed with a cloth it becomes strongly electric, attracting bits of paper, etc. As already noted, our word electricity comes from the Greek for amber, this seeming to be one of the first minerals in which this property was noted. Amber being a poor conductor of heat feels warm rather than cold in the hand, contrary to most minerals. It is attacked but slowly

by alcohol, ether and similar solvents, a property by which it may be distinguished from most modern gums and some other fossil ones. In composition it is an oxygenated hydrocarbon, the percentages of these elements being in an average sample, carbon 78.94, hydrogen 10.53 and oxygen 10.53. The mineralogical name of amber is *succinite*, a word derived from the Latin *succum*, juice. One of its constituents is the organic acid called succinic acid.

The present source of most of the amber of commerce is the Prussian Coast of the Baltic Sea, between Memel and Dantzic, although it is found as far west as Schleswig-Holstein and the Frisian Islands and even occasionally on the shores of Denmark, Norway and Sweden. From time immemorial pieces of amber have been cast upon the shore in these localities and their collection and sale has afforded a livelihood to coast dwellers. Such amber is called sea stone or sea amber and is superior to that obtained by mining, since it is usually of uniform quality and not discolored and altered on the surface. Owing to its lightness the amber is often found entangled in seaweed and the collectors are accustomed to draw in masses of seaweed and search them for amber. Amber so obtained is called *scoopstone*, nets being sometimes used to gather in the seaweed. In the marshy regions men on horse-back, called *amber riders*, follow the outgoing tide and search for the yellow gum. It is also searched for by divers to some extent. From the earliest times the title to this amber has vested in the State and its collecting has been done either under State control or as at present when a tax is levied by the government upon it. This tax is levied on the amber that is mined as well as that obtained from the sea and brings a revenue at the present time of about \$200,000.

Up to 1860 the methods of procuring amber were largely confined to obtaining it in the manner above noted. As it was evident however that the sea amber came from strata underneath and that if either by dredging or mining these strata could be reached a much larger supply could be obtained, exploration was carried on by mining methods

with successful results, and the principal amount of the amber of commerce is now so obtained. The strata as shown in the mines of Samland, the rectangular peninsula of East Prussia where most of the mining is carried on, are: First, a bed of sand; below this a layer of lignite with sand and clay, and following this a stratum of greensand, fifty or sixty feet in thickness. While all these strata contain scattered pieces of amber, it is at the bottom of the greensand layer that the amber chiefly occurs, in a stratum four or five feet thick and of very dark color. It is called the "blue earth." This stratum is of Tertiary age and there can be no doubt that its amber represents gum fallen from pines which grew at this period and whose woody remains are represented to some extent in the layer of lignite. It is probably true as Zaddach remarks that the amber has been collected here from older deposits. One of the most interesting proofs of the vegetable origin of amber is the occurrence in it of insects, sometimes with a leg or wing separated a little distance from the body, showing that it had struggled to escape. These insects include spiders, flies, ants and beetles, while the feather of a bird has even been found thus preserved. Indeed the amber deposits have furnished important contributions to our knowledge of Tertiary life. Inasmuch as the pieces bearing such remains are valued more highly than ordinary amber, unscrupulous persons have at times found profitable employment in boring cavities into pieces of amber, introducing flies or lizards into them and then filling up the hole with some modern gum of the same color. It is said that all amphibious or water animals seen in amber have been introduced in this way.

Besides the counterfeiting of the inclusions of amber there are several substitutes for the gum itself. These are chiefly celluloid and glass, the substitution of the former being dangerous if used for the embellishment of pipes, on account of its inflammatory character. Celluloid can be distinguished from amber by the fact that when rubbed it does not become electric and gives off an odor of camphor instead of the somewhat aromatic one of amber. It is also quickly

attacked by alcohol or ether, and when scraped with a knife gives a shaving rather than a powder as amber does. Glass can be distinguished by its cold feeling and greater specific gravity.

Besides these substitutes it has been found possible by heating and pressing the scraps of amber not large enough for carving to make them into a homogeneous mass which is sometimes sold as amber and sometimes as amberoid. Amber is worked to desired shapes by turning it on lathes or by cutting by hand. By heating it in linseed oil it becomes soft so that it can be bent and often all opaque spots can be made to disappear by such treatment. The amber which is most highly prized of any in the world comes from Sicily. Eight hundred dollars have been paid for pieces of this no larger than walnuts, making their value nearly equal to that of diamonds. The beauty of the Sicilian amber consists in the variety of colors which it displays, blood red and chrysolite green being not uncommon, and the fact that these often exhibit a brilliant fluorescence, glowing within with a light of different color from the exterior. Chemically the Sicilian amber is not the same as the Prussian as it contains less succinic acid and is somewhat more soluble. In other respects it is not essentially different. It occurs chiefly on the eastern and southeastern coasts being washed up in a manner very similar to the Prussian amber.

Amber has been found in several places in the United States, but there is little of commercial value. It is mostly connected with the Cretaceous glauconitic or green sand deposits of New Jersey, fragments being frequently found there. This amber is of yellow color but not so compact or lustrous as foreign amber. Amber has also been reported from the marls of North Carolina, some of the coal beds of Wyoming and in connection with lignite in Alaska. In the latter region the natives are said to carve it into rude beads.

Amber occurs in small quantities in several countries of Europe, such as near Basel in Switzerland, near Paris in France, and near London in England. It is also found in many parts of Asia, these localities being a source of supply

to the Asiatic countries such as China and India. Occasionally amber is obtained from Mexico which has the beautiful fluorescence of the Sicilian article, though the exact locality whence it comes is not known. Specimens of carved amber are found among the relics of the Aztecs and it is probable that they used it for incense. The early use of amber by European peoples has already been referred to. There are references to it in the most ancient literature and worked masses of it are found among human relics of the greatest antiquity. Up to comparatively modern times it was an important article of commerce among widely scattered peoples and had much to do with bringing about communication between them. Together with tin it was one of the chief objects which led the Romans to penetrate the Gallic regions to the west and north of the Mediterranean and Pliny says that "it had been so highly valued as an object of luxury that a very diminutive human effigy made of amber had been known to sell at a higher price than living men, even in stout and vigorous health." One of the most elaborate of the Greek myths is that which accounts for the origin of amber. It runs in this wise:—Phaethon, undertaking to drive the chariot of his sun god father, Helios, lost control of his steeds and approaching too near the earth set it on fire. Jupiter to stop him launched a thunder-bolt at Phaethon and he fell dead into the Eridanus. His sisters lamenting his death were changed into poplars and their tears became amber.

In the *Odyssey* one of Penelope's admirers gives her an amber necklace, and Martial compares the fragrance of amber to the fragrance of a kiss. Milton writes of amber and Shakespeare mentions it both in "*Love's Labor Lost*" and "*The Taming of the Shrew*."

Necklaces of amber are popular wedding presents among the peasants of Prussia and they form an important feature of the ornaments worn by many African chiefs.

The properties assigned to amber both as a charm and as a medicine have been many. From the earliest times it has been used as an amulet, being supposed to bring good luck and to protect the

wearer against the evil eye of an enemy. Necklaces of amber beads are used to this day as preventive or curative of sore throat and the Shah of Persia wears around his neck a cube of amber reported to have fallen from heaven in the time of Mohammed, which is supposed to have the power of rendering its wearer invulnerable. Amber was also taken internally in former times as a cure for asthma, dropsy, toothache and other diseases and to this day is prescribed by physicians in France, Germany and Italy for different ailments.

The use of amber for artistic and decorative purposes has declined considerably since the Middle Ages, but magnificent illustrations of its employment for these purposes are to be seen in many European museums, notably the Green Vaults of Dresden.

Though so soft and easily destructible a substance it endures with ordinary care as well as the hardest stone, and works of art formed from amber are as well preserved as any to be found.

MALICHITE.

Malachite is a green opaque mineral whose color indicates a salt of copper. It is a carbonate of copper containing water, the percentages being in the typical mineral, cupric oxide 71.9, carbon dioxide 19.9, and water 8.2. It is the common form which copper assumes when it or even its ores oxidize in the air. Many of the green stains on rocks or minerals can be correctly referred to malachite. It is only valued for ornamental purposes however when it occurs in compact masses usually exhibiting concentric layers. Malachite in this form takes a fine polish. Malachite is not a hard mineral, its hardness being between 3.5 and 4. It can therefore be scratched with a knife. It is comparatively heavy, weighing four times as much as an equal bulk of water. When heated before the blowpipe it fuses easily, coloring the flame green. By heating long enough on charcoal it can be made to yield a globule of copper. It is easily attacked by common acids, causing effervescence of carbon dioxide. This test can be used to distinguish it from the silicate of copper, *chrysocolla*, which has the same color.

Besides its occurrence in massive forms

as noted above Malachite not uncommonly occurs in tufts and rosettes incrusting other minerals. This is an especially common occurrence in mines in Arizona and affords specimens of great beauty especially when the green tufts of malachite are seen upon brown limonite, for then the appearance of moss on wood is closely simulated. Such material is of course too fragile to be used for decorative purposes.

Malachite is prepared for ornamental use by sawing masses of the character of those previously referred to into thin strips which are then fastened as a veneer on vessels of copper, slate or other stone previously turned to the desired shape. Putting pieces together so that neither by their outlines nor color will it appear that they are patchwork requires a high degree of skill and such work is done almost exclusively in Russia. Table tops, vases and various other vessels are manufactured in this way and form objects of great beauty. The pillars of the Church of Isaac in St. Petersburg are of malachite prepared in this way and there are similar pillars in the Church of St. Sophia, Constantinople, said to have been taken from the Temple of Diana at Ephesus.

Occasionally the desired object can be turned from a single piece of malachite, but pieces of sufficient size for this purpose are rare. Bauer describes one piece found in the Gumeschewsk mines which was 17 1-2 feet long, 8 feet broad and 3 1-2 feet high and compact throughout. This is probably the largest single mass known.

Russia furnishes most of the malachite suitable for work of this kind and the art of cutting and fitting the stone is possessed almost exclusively in that country. Most of the Russian malachite has been obtained from the mines of Nischne-Tagilsk and Bogoslawsk in the northern Urals, or Gumeschewsk in the southern. The supply has gradually de-

creased till now only the Nischne-Tagilsk mines are productive. The malachite is said to occur there in veins in limestone.

Besides the Urals, fine malachite suitable for cutting comes from Australia. Burra Burra in New South Wales and Peak Downs in Queensland are localities whence good Australian malachite is obtained.

Malachite as a mineral is common in copper mines in the United States but it is only in Arizona that it is found of a quality suitable for cutting. A variety from Morenci, Arizona, consists of malachite and azurite and gives a combination of green and blue that is unique and pleasing. (See colored plate.) Less use has been made of such material for ornamental purposes than might have been for most of it has unfortunately been smelted as a copper ore.

Malachite is rarely used for rings or small jewels but is cut into earrings, bracelets, inkstands and similar objects. Art objects of malachite seem to have been in much favor with Russian emperors as gifts to contemporaneous sovereigns, and so bestowed are to be seen in numerous palaces in Europe. Perhaps the most famous of these gifts is the set of center tables, mantel pieces, ewers, basins and vases presented by the Emperor Alexander to Napoleon and still to be seen in an apartment of the Grand Trianon at Versailles.

Malachite was well known to the ancients and like other precious stones was worn as an amulet. It was called pseudo-emerald by Theophrastus. Its name is from the Greek malake, the word for malloes and was given doubtless on account of its green color.

Azurite, the blue mineral which often accompanies malachite is likewise a hydrous carbonate of copper and occasionally occurs so that it can be used with malachite for ornamental purposes.

OLIVER CUMMINGS FARRINGTON.



THE LEAF BUTTERFLY.

(*Kallima paralekta.*)

There are many instances of protective imitation or mimicry in nature, but none are more pronounced, more perfect or more interesting than that shown by the leaf butterflies. Briefly defined, the phenomenon of mimicry is that relation which obtains when "a certain species of plants or animal possesses some special means of defense from its enemies and some other species inhabiting the same district or a part of it, and not itself provided with the same special means of defense, closely resembles the first species in all external points of form and color, though often very different in structure and unrelated in the biological order." Many animals, such as some tree-lizards, resemble the colors of the environment in which they live, either for protection from enemies or in order that they may more easily catch their prey. Some arboreal snakes hang from the boughs of trees like the drooping ends of creeping vines.

The coloring of the under surface of the wings of the leaf butterflies very closely resembles the color of a dried leaf. As dried leaves vary in color and appearance, so do the butterflies vary in the color and markings of their wings. It is said that even in the same species, the under surface of the wings may be of various shades of brown, yellow, ash and red. But the imitation of the dried leaf does not alone rest on the color, for often, here and there, may be seen small groups of dark colored spots which strikingly resemble the patches of fungi that are so common on leaves. The mimicry of this butterfly is purely protective and not for the purpose of deceiving its prey.

Dr. Alfred Russel Wallace in his "Malay Archipelago" writes of this butterfly as he found it in its native ele-

ment. He says, "This species was not common in dry woods and thickets, and I often endeavored to capture it without success, for after flying a short distance it would enter a bush among dry or dead leaves, and however carefully I crept up to the spot, I could never discover it till it would suddenly start out again, and then disappear in a similar place. At length I was fortunate enough to see the exact spot where the butterfly settled, and though I lost sight of it for some time, I at length discovered that it was close before my eyes, but that in its position of repose it so closely resembled a dead leaf attached to a twig as almost certain to deceive the eye, even when gazing full upon it. I captured several specimens on the wing, and was able fully to understand the way in which this wonderful resemblance is produced.

"The ends of the upper wings terminate in a fine point, just as the leaves of many tropical shrubs and trees are pointed, while the lower wings are somewhat more obtuse, and are lengthened out into a short thick tail. Between these two points there runs a dark curved line, exactly representing the midrib of a leaf, and from this radiate on each side a few oblique marks, which well imitate the lateral veins. These marks are more clearly seen on the outer portion of the base of the wings and on the inner side toward the middle and apex, and they are produced by striae and markings which are very common in allied species, but which are here modified and strengthened so as to imitate more exactly the venation of a leaf.

"The habit of the species is always to rest on a dead twig and among dead or dried leaves, and in this position, with the wings closely pressed together, their

outline is exactly that of a moderately sized leaf, slightly curved or shrivelled. The tail of the hind wing forms a perfect stalk, and touches the stick while the insect is supported by the middle pair of legs, which are not noticed among the twigs and fibers that surround it. The head and antennae are drawn back between the wings, so as to be quite concealed, and there is a little notch hollowed out at the very base of the wings, which allows the head to be retracted sufficiently. All these varied details combine to produce a disguise that is so complete and marvellous as to astonish

everyone who observes it; and the habits of the insects are such as to utilize all these peculiarities, and render them available in such a manner as to remove all doubt of the purpose of this singular case of mimicry, which is undoubtedly a protection to the insect. Its strong, swift flight is sufficient to save it from its enemies when on the wing, but if it were equally conspicuous when at rest, it could not long escape extinction owing to the attacks of the insectivorous birds and reptiles that abound in tropical forests."

IN AUTUMN.

The waves come galloping up the shore,
The trees are flinging their arms about.
All night I have heard the wind's loud roar,
And the surf call back with angry shout.

And after the wind a grieving rain
Comes sighing and sobbing past my door,
"The summer flowers I seek in vain,
Is my work of love forever o'er?"

One day ago and a soft sun shone,
Butterflies flitted through quiet air,
But now both they and the birds are gone
And soon will the trees be stripped and bare.

Though winds blow cold and the skies are gray,
The sun of summer still shines for me,
For naught can drive from my heart away,
The memory of bird and flower and tree.

GRACE WICKHAM CURRAN.

BEAUTIFUL VINES TO BE FOUND IN OUR WILD WOODS.

As the summer closes and the trees, flowers and vines have all reached their greatest perfection, have fulfilled their mission in life, and in addition have beautified all the spring and summer our lawns and verandas, and have been admired as wonderful children of the florists' skill, how many of us know that many of them and especially most of these beautiful vines, could be found in our wild woods just for the looking? That we could with our own hands transplant them to our homes and have just as beautiful vines on our little porches and verandas as any millionaire on our boulevards?

One vine that we see covering our stateliest mansions and growing over our most humble little cottage, is common in all the woods of the United States from Maine to Florida, from New York to California, is the *Ampelopsis quinquefolia*—or Virginia creeper—American ivy or woodbine—its name changing with the portion of the country you happen to be when you find it, for we see it frequently under its various names in cultivation, and it certainly grows in great abundance and in the most graceful ways in our woods, over trees and shrubs and old rock fences, clinging in the most loving way to any surface with which it comes in contact. It belongs to the order Vitaceæ or Vine family, which is a family of climbing shrubs, and to which all of our wild grapes belong.

Its name *Ampelopsis* is from two Greek words, meaning vine and appearance; *quinquefolia*, five leaved or fingered; its leaves being alternate and compound, with five leaflets, long and pointed, radiating from the center. It

may be that it was meant to signify that our five fingers may handle it recklessly and not run any risk of poisoning, as so many people are fearful of being—they being unable to distinguish it from the *Rhus radicans* or poison ivy—which belongs with the sumachs, and has only three leaflets or divisions in its leaves. This poison ivy could be so easily exterminated if every one who finds a plant of it would dig it up and burn it. It surely is as much one's duty to help exterminate a poisonous plant as it is to cultivate and nourish an ornamental, beautiful, harmless one. Yet there is hardly a park in our larger cities where you will not find the *Rhus radicans* or poison ivy growing.

In the Virginia creeper we will find tendrils growing from the base of its leaves, that swell at their tips into sucker like disks, by means of which the plant clings firmly to walls and trees in its extensive climbing. The flowers of this beautiful vine are small, inconspicuous and greenish in color, with five concave thick spreading petals, with a calyx slightly five toothed, a two celled ovary or seed vessel, each cell containing two seeds. It blooms early in June and in the early autumn, when its leaves are turning the most exquisite shades of scarlet and crimson, these little flowers develop into clusters of deep blue or purple berries about the size of peas.

The whole vine is really more beautiful in the autumn than it is in the spring, and it surely does more than its part in making our American woodlands such great expanses of gorgeous coloring in the fall as to attract the attention and remarks of all visiting foreigners.

MISS J. O. COCHRAN.

SOME SNAILS OF THE OCEAN.

The Marine snails outnumber all of the other mollusks and their shells are far more beautiful, those in the tropics having the most gaudy colors imaginable. The animals are all formed on the same plan although each family has some peculiarity not shared by its relatives. They are found in all parts of the world, and in all climates. While the majority of species live either between tides on near low water, there are not a few which live in the abysses of the ocean and have been dredged at a depth of three thousand fathoms, a distance of over three miles. The average depth at which mollusks are found in any number is about one thousand fathoms. The variability of marine snails is so great that only a few typical forms can be mentioned.

The Limpet or *Patella* is a familiar mollusk to many visitors at the sea shore. This shell is a depressed, conical, oval disk, looking not unlike a miniature shield. They live on rocks, to which they tenaciously cling. Some experiments which were made on the English limpet several years ago showed that they could sustain a weight of thirty pounds attached to their shell without being pulled from the rock. The animal seems to have a pretty clear idea of local geography, for it invariably returns to the same place after its excursions for food and the rock in some localities has been hollowed out to a considerable depth by the continuous dwelling thereon of the limpet. If the surface of the rock is uneven the shell grows in such a manner as to fit these inequalities. While grazing along the sides of a rock covered with fine sea weed it will leave a track like a worm and will clear off quite an area in a very short space of time. This track is made by the radula, which is very long and is thrust out and loaded with food which it carries to the mouth. When at rest the radula is coiled like a watch spring. On the British coast the limpet is used as an article of food and primitive man not only ate the mollusks but made a

necklace by stringing the shells together. There are several hundred species of limpet-like shells and they are found in all parts of the world, especially on rocky shores.

A family of shells closely related to the limpets is the *Fissurellidæ*, or key-hole limpet, distinguished from the last family by having a slit or foramen in the apex of the shell, through which the waste products of digestion are discharged. This slit resembles a key-hole and for this reason they are called key-hole limpets. The shells of *Fissurella* are generally rougher than those of *Patella* and they live, as a rule, in warmer seas. In habits the key-hole limpet resembles the limpet, living in one rocky place and making excursions for food. In the young shell the spire is without a perforation, this appearing as the shell increases in age. There are over one hundred species of key-hole limpets, several handsome species of which inhabit Florida and the West Indies.

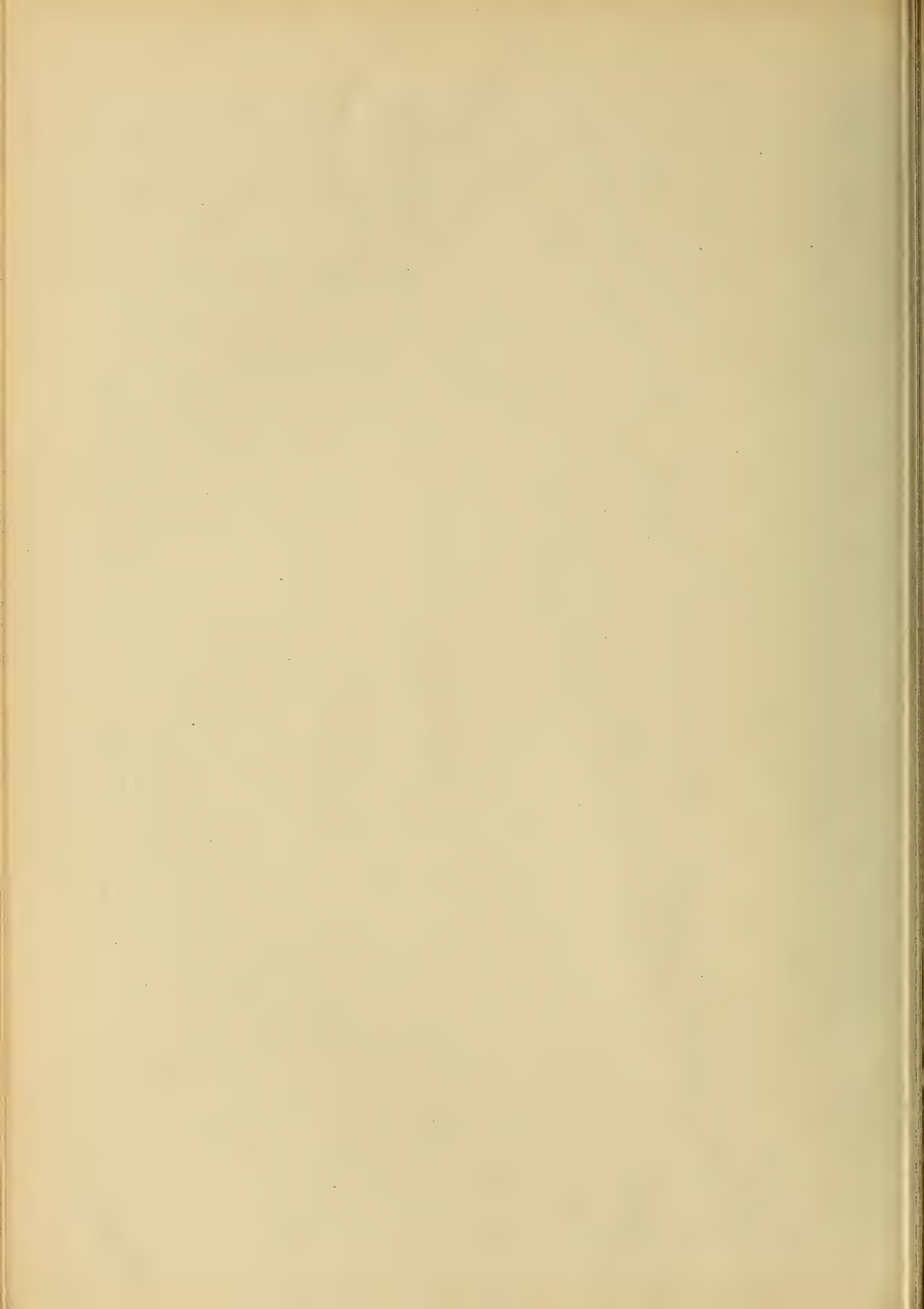
The *Haliotis* or abalone shells abound in many parts of the world and are widely known for their beauty. The largest and finest shells live on the coast of California where they attain a length of ten inches. The shells are flat, though made in the form of a spiral and are perforated near the edge of the last whorl, which is many times the size of all the rest combined, and through this perforation the water from the gills, together with the waste products of the animal, are poured out. As the shell increases in size the old holes are filled up and new ones are formed. The inside of the shell is resplendent with iridescent colors, particularly about the region of the huge muscle scar, and when the outside is polished they become objects fit for the palace of a king. A large part of the mother-of-pearl is furnished by these shells and a vast number are annually exported for the purpose of making pearl buttons. In England they are called "Ormers" but the correct name, if we translate the generic title, is "Seae-ear" or ear-shells. To the Chinese the



SOME SNAILS OF THE OCEAN.

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Strombus auris-dianae (Philippines).	Bulla ampulla (Philippines).	Harpa nobilis (Philippines).
Littorina angulifera (United States).	Fissuridea listeri (United States).	
erita peloronta (Florida).	Crepidula fornicata (United States).	Terebra lamarckii (Sandwich Islands).
Mitra pontificalis (Indian Ocean).	Haliotis assimilis (California).	Turbo petholatus (Indian Ocean).
		Cerithium aluco (East Indies).



abalone is an object of great economic importance and they gather them in large quantities, dry the animals and use them as food, principally in the form of soup, which is said to be very delicious. The abalone clings to the rocks with terrible power and many a lonely fisherman has been drowned while gathering this mollusk, by getting his fingers caught between the shell and the rock.

There are three families of shells which are much sought after by conchologists, these are the top shells (*Trochidae*), the turban shells (*Turbinidae*) and the pheasant shells (*Phasianellidae*). Altogether they embrace nearly five hundred species which live from the shore between tides to the lowest depths of the ocean. The shells of the top shells vary to a wonderful degree; some are large, others small; some are perfectly plain and smooth while others are ornamented by impressed lines, ribs and granules, some are very thin and delicate while others are large and massive. Many of the species are richly colored with brown, purple, black, green and yellowish, and all are more or less pearly. They are all vegetable eaters.

One of the best known is *Trochus niloticus*, a large, massive shell striped with brown, which is seen on the mantle of many households. One of the prettiest top shells is the ringed top shell (*Calliostoma annulatum*) found abundantly in some parts of California. The surface is marked by several rows of delicate points and the suture is bordered by a rich line of purple. It lives in the seaweed off shore and may be seen in pleasant weather crawling about among the weeds. During storms or rough weather this frail mollusk sinks to the bottom of the sea. The top shells inhabit many parts of the world, the coasts of Florida and California producing several very handsome and interesting species.

The Turban shells include many fine and large shells, a notable species being *Turbo marmoratus*, the "green turban" of the dealers. This shell is about seven inches in diameter, rich green outside and pearly inside. It is largely used for mother-of-pearl work and for making pearl buttons. It is said that the early Scandinavian monarchs used this shell

as a drinking cup. At the present time it is used for ornamental purposes, richly mounted. In Japan the animal is used for making chop suey, being cut in little dice-like pieces.

The Pheasant shells are beautifully variegated with red, black, white and brown and are very interesting animals to study alive. When crawling, the left side of the foot moves forward while the right remains stationary, and when the right side moves the left remains stationary. This curious mode of progression has been likened to the canter of a horse. The larger species, with beautifully variegated shells, inhabit Australia, while the smaller species live in the Mediterranean Sea, South Africa, the West Indies and California.

The Neritas are very abundant in tropical and semi-tropical countries where they live on rocks and stones near low water mark. They are said to be nocturnal and spend the night feeding on seaweed. The shell of the Nerita is solid and heavy and variously ornamented with ribs, pustules and color patterns. The "bleeding tooth shell" (*Nerita pectorata*), so named from the presence of a red spot near one of the columella teeth, is a typical member of this genus. A species living in the Philippine Islands is said to climb trees to a considerable height.

The family Cerithiidae comprises some very handsome shells which inhabit salt, brackish and fresh water. They are found throughout the world but the finest species live in the tropics. The spire is very long and is composed of many whorls. Some shells are smooth and polished, while others are marked by frills, knobs, spines and ribs. The name *Cerithium* is from the Greek word *ceration*, meaning a small horn, and is used because of the horn-like shape of the shell. This family has its giants and also its pigmies, the latter being pretty, reticulated shells from one fourth to three fourths of an inch in length, living among the eel grass and other vegetation along the shore. There are over a hundred species of these small shells, and some when handled discharge a bright green fluid.

Whoever visits the seashore is bound

to become intimately acquainted with the Littorinas, or periwinkles, for they cover the rocky shores everywhere, millions of their rounded shells clinging to the rocks when the tide goes out. They feed on the algae which grows on the shore. They are found in both brackish and fresh water. The common periwinkle (*Littorina littorea*) is extremely abundant on the shores of southern Europe and the northern part of the United States. In England it is used as an article of food and it is said that nearly two thousand tons are gathered annually and that a thousand persons are employed in capturing it. In London and other large cities they are sold on the street, the animal being picked out with a pin. It is used for bait in some of the fisheries and the oystermen plant many bushels on their oyster beds yearly to keep the seaweeds from accumulating. From these facts it will appear that this periwinkle is of considerable economic importance. All of the species are amphibious, living for a long time out of the water.

Of all the gastropods none excel the curious *Xenophora* in point of oddity. The shell is in general form like that of the top shell, but as it grows it attaches to itself small stones and pieces of shell, so that when the animal is fully grown it looks like a heap of dead shells and pebbles. This habit is in all probability to conceal the animal from its enemies. They are called "carriers" and the individuals with shells attached to their house are called Conchologists, while those with stones attached are called Mineralogists. The fragments of shells are attached with concave sides upward so as not to impede the animal during locomotion. The carriers are not able to glide like other mollusks, their feet being very small. They progress by lifting the front part of the foot to an object and then drawing the hind part toward it. In this way they jump or scramble along in a ludicrous manner.

Related to the "carriers" are the slipper-shells (*Crepidula*), the horse-hoof shell (*Hipponyx*) and the bonnet-limpet (*Capulus*). The slipper shells are found in many parts of the world and are particularly abundant on the Atlantic and Pacific shores of the United States. The

shell is flat and somewhat limpet-like, and across one end, near the apex, is a little shelf which gives it the appearance of a Chinese slipper. They adhere to stones, shells, crabs and any submerged object, and modify the form of their shell to fit the inequalities of their resting place. Thus a *Crepidula* on a Pecten shell will be ribbed while the same species on a stone will be perfectly smooth. Frequently they may be seen piled one upon another in tiers of six or more. The animal generally feeds on seaweed but has been known to eat other mollusks. The bonnet limpets also belong to this family, as do the cup-and-saucer limpets (*Calyptrea*).

The family Strombidae contains many large and interesting shells. The animal is very powerful and is able to leap a considerable distance. Mr. Arthur Adams, a celebrated conchologist, thus describes its method of leaping: "Planting firmly its powerful, narrow operculum against any resisting surface, it insinuates it under the edge of its shell and by a vigorous effort, throwing itself forwards, carrying its great heavy shell with it, the animal rolls along in a series of jumps in a most singular and grotesque manner." The eyes of the animal are greatly developed. The shells of *Strombus* vary greatly in form and color. In some the outer lip is simply turned over while in others it is modified by little spines or projections. The aperture is frequently colored pink, purple or yellowish. The large *Strombus gigas* is used in carving cameos, its shell being made up of several layers of different colors. It is also ground to powder for the manufacture of porcelain and in the West Indies the animal is used as an article of food.

The Auger or steeple shells, belonging to the family Terebridae, have long been objects of interest not only to the naturalist but to the layman who places them in his house as ornaments. There are about two hundred species which are found in many parts of the world, although chiefly confined to tropical seas. The shells are very long and are composed of many tightly wound whorls, which are smooth in some species and longitudinally ribbed in others. They vary also in color, being yellowish, gray-

ish or brownish, and many species are spotted with red or white.

A group of handsome mollusks live in the tropics whose shells have been named *Mitra* by the naturalist Lamarck from their fancied resemblance to the Pope's miter. The shells are fusiform, very thick and heavy and beautifully ornamented with various colors. The surface of the shells of some species is smooth, others granulose and not a few spirally lined and longitudinally ribbed, while the columella is marked by several heavy plaits or folds. There are about two hundred species of this genus, living in all parts of the world but being more numerous in tropical regions. The Philippine Islands seem to be the metropolis of this mollusk, as of others, and their shores fairly teem with the graceful creatures. Some of them live among the coral reefs, concealing themselves in holes or among the sea weeds or under stones. Others live on the sandy or muddy beaches in which they bury themselves when the tide recedes.

The earlier naturalists were fond of applying significant names to the shells which they described and the *Mitras* have received their share. Thus we have the episcopal miter, having a white shell with brilliant red spots and flame; the papal miter, with a brown-spotted white shell; the pontifical miter, with a red-spotted shell and a coronated spire, and lastly the cardinal's miter. These four species might be called the ecclesiastical quartette.

The Harp shells, although few in species, are among the most showy of the marine snails. The shells are large and marked by many elevated ribs extending longitudinally, giving the effect of the strings on a harp, hence the name of the genus. The colors are different shades of brown which form neat festoons of dark brown lines between the ribs. The inner lip of the shell is marked by a dark brown spot and another spot is frequently developed near the upper part of the whorl. In one species (*Harpa*

rosea) the shell is marked by several rosy spots and tints, and is very beautiful. The animal of this genus is no less interesting than the shell, being variegated with many beautiful colors. The foot is long, crescent shaped in front and becomes narrowed to a point behind. The animal is said to voluntarily break off a piece of its shell when irritated, as it is not able to retreat within the shell, being destitute of an operculum. It is very active and crawls about with an easy, graceful motion. *Harpa* lives only in the tropics and is found in the Indian and Pacific Oceans and on the west coast of America.

The Bubble shells include within their number many curious and interesting animals. The typical genus, *Bulla*, numbers some fifty species of smooth, globular shells, frequently mottled like a bird's egg. The aperture is as long as the shell and the outer lip is thin and sharp. The animal is large and fleshy and partly envelops the shell. The bubble shells love sandy mud flats in which they bury themselves or find concealment under masses of sea weed. Like many land shells they exude vast quantities of mucus to moisten their skin when the tide is out. These animals are carnivorous, living on bivalves and snails, which are swallowed whole and reduced to fragments by the huge, calcareous gizzard. Not all the mollusks of this order have true shells. The so-called sea hares, have large, flabby bodies in which is lodged a small, oblong, transparent shell. This animal lives among the sea weed, feeding upon the weed as well as upon mollusks and other animals. It discharges a violet liquid when handled which caused the ancients to believe that it was poisonous. The old Greek philosophers wrote a great deal on this subject, believing that to even touch the animal with a stick would cause death. Though repulsive looking creatures they are perfectly harmless and are even eaten raw by the natives of the Friendly and the Society Islands.

FRANK COLLINS BAKER.

JOIN A SUNRISE CLUB.

Join a sunrise club? as is proposed in *BIRDS AND NATURE* for January. Of course I will. I have for years belonged to one of two members—my daughter and myself. Now we will transfer our membership to the new club that is to have members all over the country.

Some of our winter sunsets here in Nebraska are glorious. I am especially fond of looking at them through the thousand interlaced branches of the leafless trees. One can study tree forms and sunsets in the same picture. I wonder that every person is not a sunset observer. But some people are sunset blind, and some rarely ever look at the heavens on starry nights. I sometimes meet people who lament the fact that they cannot go to Colorado and see the mountains, of which they hear such glowing accounts. I tell them that I do not pity them at all so long as they do not care to gaze upon the most glorious sight which mortal man is permitted to see—the starry heavens. They who do not appreciate the stars and the sunsets would soon tire of the mountains.

Our summer sunsets are also glorious, but I miss some of them on account of the trees around my house. I sometimes get on my wheel and go out of town simply to see the sunset. Trees are nice, but they often hide from us something nicer. When the towns of Colorado were new, twenty-five years ago, we could see the mountains from all our west doors and windows. Now in those same towns the people must go out into the street, or even out of town, if they would see the mountains in summer.

But, say, let us have another club—a Sunrise Club. It may be asking too much to make it operative for the whole year, so we will call it a sunrise club for May and June. Those are the bird months of the year, the months when some of us are out before sunrise morning after morning, to watch the birds and to hear their wonderful concerts. Some of the pleasantest memories of my life are of early morning trips on my wheel to a certain grove in the edge of town. On those trips I have seen many a new bird—new to me—and many a glorious sunrise.

Somehow birds and the rising of the sun fit into each other beautifully.

There is something inspiring and exhilarating about sunrise that is not found in sunsets. The air is more free from dust; one's body and mind, yes, and soul, too, are in better mood to enjoy the sight; one is more pleased to welcome the sun than to bid him good night; the birds seem to think so and they give joyous welcome to the orb of day; all nature is awakening; a great thing is happening; a new day, fresh from the hands of its Maker, is being born. All hail, thou new creation! Welcome, thou glorious orb of day! Let me join with the birds in singing thy praise. Thou dost flood my soul with joy even as thou dost flood the earth with light. Yes, let us have a sunrise club for May and June, except perhaps the cloudy and stormy mornings when even the birds seem to lie abed. Who will join?

ROSELLE THEODORE CROSS.



TOMATOES.
(*Lycopersicum esculentum*).

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THE TOMATO.

(*Lycopersicum esculentum*.)

The tomato is an herbaceous plant, belonging to the nightshade family (Solanaceae), the same family to which the potato and tobacco belong. It has numerous rather large, showy, cut leaves, which are more or less woolly, due to numerous hair cells or trichomes. It has numerous not attractive or pleasant smelling flowers, with numerous yellow or red berries, which vary in size and form. It is a native of South America, but is very extensively cultivated in nearly all countries excepting the cold northern regions. In 1596 it was introduced into England as an ornamental and medicinal plant. Previous to about 1840 it was little used in the United States, but now it is very extensively grown in green houses, gardens and as a farm crop. For an early crop the seed is planted in a hot bed, so that the plants may be of suitable size for transplanting as soon as the danger of frost is past. The plants are placed three or four feet apart in fairly rich soil and the soil frequently tilled and kept free from weeds. The plants grow about three or four feet high, become quite spreading and rank so that it is desirable to tie the top portions to stakes driven into the ground to keep the plants upright; this procedure is also of advantage in ripening the fruit.

Botanically, the fruit is a berry, and before ripening is of a bright green color, changing to red in the red variety and to yellow in the yellow variety. The same plant bears flowers and ripe fruits, so that fruits may be gathered for a considerable period.

Tomatoes have a peculiar flavor and somewhat acid taste when ripe. The pulp contains many seeds. As with other garden plants, there are numerous culture

varieties. Some are no larger than cherries. Some are pear-shaped; others large and flattened at the ends. Some are nearly spherical, others quite irregular. The ripe fruits must be gathered promptly, as they decay very readily and quickly.

At the present time the tomato is very little used medicinally, but is very extensively used as an article of diet. Picked green they are picked either alone or mixed with other vegetables. The ripened fruit is prepared in a multitude of ways. Peeled and sliced raw, adding salt, pepper, vinegar and sugar. Boiled in soups, mixed with sauces, baked or fried entire, fried or baked, mashed, mixed with stale bread and seasoned, etc. There is a popular superstition that eating tomatoes to excess causes cancer. Tomato preserves are highly relished by some; likewise tomato pies.

The general opinion prevails among scientists, as well as laymen, that the tomato is nourishing and wholesome. It is certainly harmless when ripe, but the green pickled preparations are not nourishing nor particularly wholesome. The notion that pickles aid digestion is a mistaken one. The spices added may stimulate, but the green fruit particles are not digestible.

The word tomato is of American Indian origin. The popular name love apples (German *Liebesäpfel*) is a translation of the French *pomme d'amour*, which is a corruption of *pomo dei Mori*, a name derived from Morocco. The Germans also designate them apples of Paradise (*Paradiesäpfel*).

The entire plant, including flowers and green fruit, have a somewhat heavy, disagreeable odor, a characteristic common to many members of the nightshade family.

ALBERT SCHNEIDER.

THE BROOK.

I come from haunts of coot and hern,
I make a sudden sally,
And sparkle out among the fern,
To bicker down a valley.

By thirty hills I hurry down,
Or slip between the ridges,
By twenty thorps, a little town,
And half a hundred bridges.

I chatter over stony ways,
In little sharps and trebles,
I bubble into eddying bays,
I babble on the pebbles.

I wind about, and in and out,
With here a blossom sailing,
And here and there a lusty trout,
And here and there a grayling.

* * * * *

I steal by lawns and grassy plots,
I slide by hazel covers;
I move the sweet forget-me-nots,
That grow for happy lovers.

I slip, I slide, I gloom, I glance,
Among my skimming swallows;
I make the netted sunbeam dance
Against my sandy shallows.

And out again I curve and flow
To join the brimming river;
For men may come and men may go,
But I go on forever.

—ALFRED TENNYSON.

BIRDS AND NATURE.

ILLUSTRATED BY COLOR PHOTOGRAPHY.

VOL. XII.

NOVEMBER, 1902.

No. 4

NOVEMBER.

When thistle-blows do lightly float
About the pasture-height,
And shrills the hawk a parting note,
And creeps the frost at night,
Then hilly ho! though singing so,
And whistle as I may,
There comes again the old heart pain
Through all the livelong day.

In high wind creaks the leafless tree
And nods the fading fern:
The knolls are dun as snow-clouds be,
And cold the sun does burn.
The ho, hollo! though calling so,
I cannot keep it down;
The tears arise unto my eyes,
And thoughts are chill and brown.

Far in the cedars' dusky stoles,
Where the sere ground-vine weaves,
The partridge drums funereal rolls
Above the fallen leaves.
And hip, hip, ho! though cheering so,
It stills no whit the pain;
For drip, drip, drip, from bare branch-tip,
I hear the year's last rain.

So drive the cold cows from the hill,
And call the wet sheep in;
And let their stamping clatter fill
The barn with warming din.
And ho, folk, ho! though it is so
That we no more may roam,
We still will find a cheerful mind
Around the fire at home!

—C. L. CLEVELAND.

THE PILEATED WOODPECKER.

(*Ceophloeus pileatus*.)

In years gone by, when large sections of the United States were covered with deeply wooded virgin forests frequented only by denizens of the wildwood, the Pileated Woodpecker was an abundant resident through nearly all of North America. A bird citizen of the deeper and more extensive forest regions, it has gradually retreated before the advance of man, and it is a very rare visitant in the Eastern States and is only found in the thickly settled and heavily timbered bottom lands which the human intruder seldom penetrates. In the Southern States it is more common and may be considered abundant in some sections.

Mr. Manly Hardy says: "The Pileated Woodpecker is a constant resident of Maine, but rarely leaves the vicinity of large timber. It prefers places where large hemlocks abound, especially those localities where a few have been killed by camp building or small fires." A strange feature of its distribution is that, though it is distributed quite generally throughout North America, there are many heavily timbered areas, well suited to its habits, in which it is not found. If it occurs at all it is very rare in the Southern Rocky Mountain regions, and is also rare in Alaska.

The Pileated Woodpecker is a beautiful bird of great size and strength. Its bill is both large and powerful. In fact, it is exceeded in size by but one of the Woodpeckers—the ivory-billed species—which is a resident of the Southern States. It is quite variable in its habits. In some sections it is very shy and retiring, while in others it is quite tame and becomes quite accustomed to man if not ruthlessly annoyed. Mr. Hardy, writing of his experience with this bird in the woods of Maine, says: "I once had two so tame they would allow me to sit within four paces of them, and put my hand

upon the tree when they were not ten feet above my head." Mr. Chapman, writing of its habits in the cypress swamps of Florida, says: "There, contrary to the experience of Audubon, I found it by no means a wild bird. Indeed, flickers were more difficult to approach," and he also writes: "I have called these birds to me by simply clapping my slightly closed palms, making a sound in imitation of their tapping on a resonant limb." Another writer states that when called in this manner, "they seem to lose their usual shyness and seem stupefied at not finding their mate, as they had expected."

Few birds are more useful in the preservation of the forest from destruction by insect pests. "A workman is known by his chips." The energy and perseverance of the Pileated Woodpecker, as it seeks for the destructive borers or other injurious insects, in the bark and wood of afflicted trees, is amply attested by numerous denuded trees and by the strips of bark and piles of chips lying on the ground. The hammering of the more familiar species of woodpeckers is but a light tapping when compared with the loud and resounding whacks of its powerful strokes. It has been known to "chisel holes six or eight inches deep in cedar and other soft-wood trees, and as large as the holes in a post-and-rail fence," and to "pick a large hole through two inches of frozen green hemlock to get at the hollow interior." It seldom, if ever, attacks healthy trees and it is a constant resident of extensive forests that have been swept by destructive fires and the bare tree trunks left to decay.

Mr. Wilson, that enthusiastic student of bird life, writes in his usual interesting manner concerning the habits of the Pileated Woodpecker. In his "American Ornithology" he says: "Almost every old



FROM COL. CHH. ACAD. SCIENCES.

PILEATED WOODPECKER.
(*Ceophloeus pileatus*).
 $\frac{1}{2}$ Life-size.

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trunk in the forest where it resides bears the marks of his chisel. Wherever it perceives a tree beginning to decay, it examines it round and round and with great skill and dexterity strips off the bark in sheets of five or six feet in length, to get at the hidden cause of the disease, and labors with a gayety and activity really surprising. I have seen it separate the greatest part of the bark from a large, dead pine tree, for twenty or thirty feet, in less than a quarter of an hour. Whether engaged in flying from tree to tree, in digging, climbing or barking, he seems perpetually in a hurry."

During the mating season it is exceedingly noisy, not only spending much time in drumming, but also frequently uttering its love notes which to Mr. Nehrling sounds like "a-wuck, a-wuck." Mr. Chapman describes their usual call note as a "sonorous cow-cow-cow, repeated rather slowly many times," and when two birds come together they utter a "wichew note" similar to that of the flicker. Its note of alarm has been likened to an oft-repeated ha-he, ha-he, ha-he. The same observer hears in its call note a constant repetition of a-wick, a-wick and at times tack-tack-tack.

For its nest the Pileated Woodpecker excavates cavities in tree trunks at heights varying from twenty to eighty feet above the ground. Both sexes assist

in the work of making the cavity which, Major Bendire states, vary from seven to thirty inches in depth, and is gradually enlarged toward the bottom, where it is about six inches wide." He also says that it takes from seven to twelve days to complete it and when completed it is quite an artistic piece of work, the walls of the cavity being quite smooth and the edges of the entrance being nicely beveled. The eggs are usually deposited on a layer of chips. Not infrequently every chip, as soon as it is loosened, is removed to a distance in order to remove every trace of the nesting site.

Birds as well as other animals are afflicted with parasitic worms. Mr. Langdon found on dissecting a Pileated Woodpecker, a "slender tape-worm about fifteen inches long and one-thirty-second of an inch wide," and in the tissues beneath the skin of the neck "were two thread-like, round worms of a pale pinkish tint and about three-fourths of an inch in length."

Of this wonderful bird we may truthfully say with Mr. Langille, "Whether one notes his strong flight, his elastic bounding and springing along the trunks of the trees, the effective chiseling of his powerful bill, or his sonorous cackling, one is particularly impressed with the spirit and immense energy of the bird."

SABBATH BY THE LAKE.

Peace smiles above the scene. The waters lie
As still and blue as the arched sky they love.
No sound salutes the ear, save that, far off,
A bird recites to his fond mate his joy;
And silence seems but deeper for the slender sound.
The butterflies, that frolic noiselessly,
Think Earth is Heaven and live by loving flowers.
The trees in social groups, link branch to branch
And root to root and smile beneath the sun.
In harmony with all about I rest.
Within my soul there dwells a thought that knows
No words, but silent, sweet, it sings to me.
Peace smiles above the scene, 'tis Sabbath day.

CARRIE B. SANBORN.

"HAMMOCK STORIES."

MRS. FIG TREE'S FAMILY HISTORY.

It was a nice, bright, sunshiny day, and the trees were freshly washed from a warm rain the night before, but it seemed to me when I first lay down in my hammock that they were not in as good humor as usual. Mrs. Pepper Tree had lost her sprightly manner, and her voice was quite peevish when, seeing some children pass on their way from school, she exclaimed:

"It beats me what those children do day after day, and year after year! They can't be very smart or they would have learned all their lessons long ago."

Grandma Liveoak reminded her that according to what she had heard tell, children had a lot more to learn than trees; that they were obliged to study about people and everything they ever did, and about stones and birds and the sky and the flowers, and bugs and flies and the rest, and she expected it took them some time.

"I presume they spend a great deal of their time studying my family history," said Mrs. Fig Tree. "It is a very old and important one, and even grown people go to big buildings when the bells ring, and read and learn about my family."

Her voice was as satisfied, oh, just as satisfied as could be, and she seemed to be quite pleased over something while she was talking. Mrs. Pepper gave her branches a toss, as she crossly exclaimed:

"I don't see what there is in Fig Trees to study over much! All they have anyhow is queer awkward looking leaves in the spring, then green figs growing right out of the branches, no flowers or anything, then by and by all the leaves dropping off again! I wouldn't think that would take much time or was worth much time either, and for my part I wouldn't have leaves I couldn't keep all the year round."

Mrs. Fig answered her in a very polite tone, just as if she was talking to com-

pany: "Excuse me, Mrs. Pepper, but probably you never heard that it was my family that gave the first man and woman who ever lived in the world their clothes!"

Mrs. Pepper said she never heard it, and she guessed no one else ever did either. But you could see she was getting curious, and so were the other trees, and they finally asked Mrs. Fig to tell them, and so she began.

"Long, long ago there was the most beautiful garden that ever was heard or thought of and every lovely flower that grows, and every tree that amounts to anything, was there. But the rose bushes had no thorns, and there were no spiders or bugs or worms to bother the trees and shrubs, but only great butterflies as bright as the rainbow. And there were no brambles or thistles or burrs, but only violets and clover blossoms and other flowers, and all the birds sang more sweetly than the nightingale, and the fountains were clear and sparkling, and the fruit was always ripe, and everything was just as beautiful as could be, and the first man and woman were the most beautiful of all, only they didn't have any clothes."

Mr. Pine rustled his needles in an embarrassed sort of way, and Grandma Liveoak said that didn't seem just the right thing, somehow; but Mrs. Fig calmly remarked: "That was what they thought too and so they made themselves lovely clothes out of fig leaves."

Mrs. Pepper guessed that that wouldn't help them much; that clothes made out of fig leaves would amount to no clothes at all. But here Mr. Pine spoke, saying:

"If I might with propriety venture a suggestion on so delicate a subject, I think possibly it was bathing suits the first man and woman made of the fig leaves. My friend, the East Wind, assures me that"—

"Rubbish," cried Mrs. Pepper, "rubbish! I don't believe that they ever made any clothes of her old leaves at all, so there!"

And now Mrs. Fig's voice was so polite it made me quite nervous, and she spoke very slowly. "The first man and woman went to all of the other trees and looked their leaves over very carefully, but none of them were good or pretty enough, and finally they came to the Fig tree." Here Mrs. Fig made a long pause, repeating, "Finally they came to the Fig tree. And the first woman said: 'Oh, aren't these leaves just too lovely for anything! The Fig tree is the best and prettiest of all. We will make our clothes out of her leaves. And so they did, and what's more, they got into a whole lot of trouble just because they had something to do with another tree besides the Fig.'"

Mrs. Pepper rubbed two branches together, and it made the most sneery sound you ever heard, as she asked: "I suppose you want me to believe that 'other tree' was the pepper?"

"No," replied Mrs. Fig, "I don't think there were any pepper trees in the garden at all."

Then you should have seen how angry Mrs. Pepper grew and I did wish that Grandma Liveoak would hurry and say something so there would be peace; but sure as you live, when she spoke her voice sounded strange and very dignified, and she only said:

"The other trees may have family histories too, Mrs. Fig, if they chose to boast of them!"

"A poet once said," began Mr. Pine.

But Mrs. Orange Tree interrupted him to ask what they were saying about her; that she heard "best and prettiest leaves" mentioned.

Mrs. Fig told the story all over again, and I wanted to explain to her that I had never heard it just that way; but her stubby branches were standing very firm and determined, and I knew it wouldn't do a bit of good.

"Poets," said Mr. Pine, "are the wisest people in the world, and one of them"—

"I don't care a twig for the first man or the first woman," said Mrs. Pepper crossly. "I know all the painters choose

me, and they put my leaves and my clusters of white blossoms and red berries on paper and boards, and painters are the people of all the earth who know what is beautiful, so that proves the first place mine."

"This poet once said of our family," Mr. Pine began again.

"The brides all choose me," cried Mrs. Orange, "and who in the world is so important as a bride? And if they choose me, I must be first and prettiest."

"As I remarked," said Mr. Pine, "this poet"—

But such a noise you never heard, and even Grandma Liveoak as bad as the rest, and Mrs. Pepper and Mrs. Fig and Mrs. Orange, all claiming so many things for their family. And they got to saying unkind things to each other—they really did—and you have no idea how dreadfully sarcastic trees can be. But just as I was wondering however it would all come out Mrs. Pepper stopped still for a minute, then leaned her graceful boughs fringed with fine narrow leaves way over until they kissed Mrs. Fig's bare branches, and said gently: "I am sure it was a great honor to have your pretty leaves chosen by the first man and woman, and I am very sorry I was cross."

Grandma Liveoak gave a little laugh, exclaiming, "Well, what a silly old tree I am! Do you know, I came very near being a little put out there, just for a second, simply because another tree mentioned her family." Then she praised Mrs. Fig and told her it was a good thing to think well of one's own sap and wood. And Mrs. Fig said she might have been mistaken about what the first woman said, and that probably she took the fig leaves because they were the handiest or something. And Mrs. Orange got the wind to blow over some of her prettiest blossoms to the other trees, while high above Mockingbird was singing and over on the hedge a meadow lark gave its call, and it was all very sweet and pretty.

"As I was saying," calmly remarked Mr. Pine, "a poet once said of our family:

Who is the king of all the wood?

Be it distinctly understood

It is the Pine!"

KARRIE KING.

BUILDING FOR BIRD TENANTS.

When on walking through a city park on a blustery winter day one suddenly spies the little bird houses, built by the custodian and perched high up among the branches of the trees, a smile invariably creeps over the face and a thought of summer steals into the tired brain. Would that the building of bird houses became more fashionable among our boys!

One of the simplest and most artistic of them may be formed from a cocoanut shell. The opening may be so made that the piece of shell cut out can be turned up like a little porch roof over the door. If these be fixed just at nest-building time and the architect should kindly leave the nut inside the shell the birds will be most grateful.

Down south many of the door-yard

trees seem to be growing gourd fruit. In reality the gourds (with an opening in the side of each) are tied on or hung there by means of their own crooked necks to make nests for the birds.

Sometimes one may see whole rows of them upon a pole which is nailed to a stable roof and often they are found hanging to the ragged edge of the roof of a negro cabin. As far as I can learn, the idea originated with the colored people, who take great pride in the number of birds they can attract about them by this and other kindly means. The little yellow houses seem to delight the birds so much that one is seldom put up in vain, and the tenants pay lavishly with coins of song and many a trill of joy.

LEE McCRAE.

THE LIGHT OF THE LEAVES.

Hurry, skurry through the air
Leaves are falling everywhere.
Gold and crimson meet or miss
Smile or blush at the frost king's kiss.

Whirling, twirling, o'er the ground,
Forced by merry winds around;
Piled by childish hands on high,
There, like martyred saints, to die.

Crackle crackle, sound their knells,
Imprisoned sunshine in them dwells
Like tiny tongues, 'twixt earth and sky
They whisper love to passers by.

Falling, ever falling, they,
Consumed to make the world more gay;
The misty cloud of smoke o'erhead
Seems like the veil Shakina spread.

Down and down comes memory's leaf,
Bright with hopes or sere with grief;
The brightest one in life's huge pile
Is that from which our bonfires smile.

—CORA MAY CRATTY.



STARLING.
(*Sturnus vulgaris*).
 $\frac{3}{4}$ Life-size.

THE STARLING.

(*Sturnus vulgaris*.)

The Starling belongs to an interesting family of birds, represented in America by but one species and that one only recently introduced. In the Old World, however, there are about two hundred species which are widely distributed throughout Europe, Asia and Africa.

The common Starling is a native of Europe and northern Asia and is admitted to the bird fauna of North America both because of its accidental occurrence in Greenland and of its introduction into the parks of New York city. Regarding its introduction into this country, Mr. Chapman says that it has been brought across the ocean on several occasions, but only in the case of the last importation was the effort to make it establish a home within our borders a success. "The birds included in this lot, about sixty in number, were released in Central Park, New York city, in 1890. They seem to have left the park and to have established themselves in various favorable places in the upper part of the city. They have bred for three successive years in the roof of the Museum of Natural History and at other points in the vicinity. In the suburbs about the northern end of the city they are frequently observed in flocks containing as many as fifty individuals." From the fact that it is a resident throughout the year and has endured our most severe winters Mr. Chapman thinks that the species may be regarded as thoroughly naturalized.

The common Starling easily adapts itself to its environment and withstand quite a diversity of climatic conditions. However, while it was introduced with difficulty in the eastern United States, efforts made to introduce it into the State of Oregon have not met with success. Wherever the conditions are

favorable it breeds rapidly and not uncommonly a pair will rear two broods in a season.

This engaging bird has commanded the attention of observers for centuries. Pliny speaks of it in his Natural History, and one writer has said that "its varied song, its sprightly gestures, its glossy plumage, and, above all its character as an insecticide—which last makes it a friend of the agriculturist and the grazier—render it an almost universal favorite." Some of the notes of the Starling's song are harsh but on the whole the song is pleasing and "heard as they are, at a season when every sign of returning spring is eagerly looked for and welcomed, are certainly one of the most cheerful sounds that greet the ear." Its whole energy is thrown into the song, which is uttered with ruffled feathers. It is also a mimic of no mean order. One authority says that it delights "in reproducing familiar sounds with the greatest fidelity to truth. We have heard individual Starlings reproduce the call notes of the skylark, goldfinch, wagtail, and other small birds; sometimes we have been startled on a winter's day to recognize the cry of the common sandpiper or the grating call note of a fern owl in the middle of a crowded city, and have discovered the author of our astonishment in the person of a Starling, that is pouring forth his rhapsodies from some neighboring chimney top." Pliny says: "Agrippina, the wife of Claudius Caesar, had a thrush that could imitate the human speech, a thing that was never known before. At the moment that I am writing this, the young Caesars have a Starling and some nightingales that are being taught to talk in Greek and Latin; besides which, they are studying their task

the whole day, continually repeating the new words that they have learnt, and giving utterance to phrases even of considerable length." The young birds are very noisy and while feeding and training them the parents are scarcely less so. So great, in fact, is this noisy babble that it often becomes very unpleasant.

The Starling is a gregarious bird at all times, but this habit is more marked after the breeding season has passed. It has its favorite haunts and, though a flock may be dispersed during the daytime while feeding, all will congregate in the favorite locality at nightfall. Mr. William Yarrell, in his "British Birds," gives an interesting anecdote regarding the abundance and social habits of the Starling. Speaking of an English estate, he says, "This locality is an evergreen plantation covering several acres, to which these birds repair in an evening—I was going to say, and I believe I might truly say—by millions, from the low ground about the Severn, where their noise is something altogether unusual. By packing in such myriads upon the evergreens, they have stripped them of their leaves, except just at the tops, and have driven the pheasants, for whom the plantation was intended, quite away from the grounds."

Regarding their nesting and mating habits Mr. Henry Seebohm says: "Early in April, sometimes not until the beginning of May, the Starlings have mostly mated and gone to their breeding holes. Previous to this, however, much quarreling goes on for the choice of suitable sites. The strong gain the best holes, while the weak seek quarters elsewhere. The Starling will build its nest almost

anywhere, and it needs but slight encouragement to take up its quarters in any suitable hole or box placed for its reception. It will even dislodge large tiles and burrow considerable distances under the eaves, and its bulky nest often stops up some spout, to the dismay of the householder. A hole in the gable or inside the dovecot are also favorite places, while its partiality for holes in the trees is none the less. It also commonly breeds in ruins, churches, and old masonry of every description. In the wilder portions of the country the Starling selects a hole either in a tree or a rock for its purpose, and it will often breed in great numbers in caves or in crevices of the ocean cliffs." The nest is not a fine piece of bird architecture. It is coarse and slovenly constructed with dry grass, fibers, twigs, small roots, rags, twine, paper and in fact of any substance that strikes the fancy of the bird. It is lined, though not always, with wool, vegetable down and feathers. At times when the nest is placed in hollow trees the bedding consists of powdered wood. The Starling returns to the same site year after year, but always builds a new nest.

Though the Starling will often pilfer fruit trees, especially late in the season, it is of great service to man, for its chief food consists of worms, larvae and various adult insects. It is a voracious feeder and thus destroys a large number of forms of insect life, many of which are very destructive to plant life. It "is almost as closely associated with man as the sparrow," but unlike the sparrow it is much more able to adapt itself to a change of surroundings.

NOVEMBER.

November sits at the door of her wayside tent looking out upon the valleys and mountain tops. She has torn from the trees their faded banners of yellow and their worn fringes of crimson. November is an old dame, gray-haired, somber-eyed and strong-featured. Clad in garments of dun and dusky brown, she sits resting and smoking; and that is why we get such smoky days toward the last of her stay.

Yes, November is an old gypsy dame, but she is not always melancholy. She is the month of whom artists are especially fond. While she lacks the glow of midsummer, there is compensation for the absence of bloom and radiance in the ripening of all vegetation; there is still a touch of splendid color on the hills, and the grass is green with the aftermath of summer. Beautiful mists veil the mountain tops. There is an exquisite beauty in the tints of sepia and the rich brown tones of the landscapes and in the tender grays and clear blues of November skies.

Ah, she knows, does November, that she, too, in her old age, gives promise of something sweet to come. All the trees are filled with next year's buds; the trailing things of the woods, too, are budded and wait but a few months until the first snows are gone to blossom in fragrance and gladden the bright wedding days of Spring.

Calmly she smokes, the dear old dame, sitting at the door of her tent. Near by, dim and misty, are the marshy fens, in which stand the herons like sculptured figures, where the bulrushes have turned yellow amongst the tawny tussocks. Around her the Indian creeper weaves its still brilliant strands of red and gold. Softly the willow bands drop their trailing leaves. Heavy and purple still hang the berries on the elder boughs that languidly wave in the faint breeze as if they still felt the ghosts of summer kisses.

The nut-brown face of old November looks impassively on all the changes of her season. She knows nothing is dying about her that shall not live again. Her eyes, dark, liquid, somberly deep and tranquil, have seen all the things beautiful that our eyes have missed—the wild flowers trodden down by careless feet; moonlight on far off lakes at midnight; the first pink flush of dawn on stately mountains. Ah, yes, she knows of Love; of dead folded hands, and she remembers the buds of her last year's reign. She knows that, like the sleeping buds about her now, Love shall give all things back again in the sweet springtime of Paradise, even as these same buds shall waken to bloom and beauty when their winter sleep is over.

But now the night is coming on. Deep shadows are filling the dusky stalls of the drooping hemlocks on yonder hill. Faint spicy odors of sweet fern and illusive witch hazel rise on the misty air. Dame November rises slowly, knocks the ashes from her pipe, gazes broodingly for a few moments over the fading landscape, then turns and softly closes her door. All night the solemn winds intone the requiem of Spring and Summer glories past, but at intervals listen and you will hear the sweet, thin flute of the wood-frog, faintly but hopefully voicing the promise of another Spring, with more bloom, more gladness and glory to come.

Dear old Dame November! A few more days and she will no longer be sitting at the door of her wayside tent. We love her mists, her mellow rains, her dull, rich tones of brown and faded gold. December shall disturb the brooding calm that she has left with us, but we know he cannot harm with his icy mail and glittering frost spears the tightly folded promises which the gypsy November has prepared for next year's blooming.

BELLE A. HITCHCOCK.

THE ARKANSAS GOLDFINCH.

(*Spinus psaltria.*)

The Goldfinch, social, chirping, bright,
Takes in those branches his delight.
A troop like flying sunbeams pass
And light among the vivid grass,
Or in the end of some long branch,
Like acrobats, in air they launch,
And in the wild wind sway and swing,
Intent to twitter, glance and sing.
—ROSE TERRY COOKE, "My Apple Tree."

These lines of the poet were inspired by the beautiful goldfinch so familiar to all, and usually called yellow-bird and thistle-bird. They form an appropriate introduction to a few words regarding the thistle-bird's sister species of the Pacific coast—the Arkansas Goldfinch. This bright and sprightly bird enlivens the shrubby ravines and weedy places from Oregon southward through the United States, and from the Pacific coast eastward into Colorado. Throughout its range it is quite common and nests on the plains and also in the mountains to a height of nine thousand feet. Abundant in many mountainous regions, it has been given the name Rocky Mountain Goldfinch, and the olive-green color of the plumage of its back has given it the very appropriate name Arkansas Green-backed Goldfinch.

Like the common thistle-bird, it has a social disposition and feeds with its fellows in flocks of a greater or less number. Not infrequently several individ-

uals will alight on the same plant and immediately begin a diligent search for their food of seeds. Active and of a seemingly impatient temperament, it seldom remains long in any one locality, yet a garden rich in sunflower blossoms or a field full of blooming thistles furnished so tempting a larder that a flock may patiently labor therein for some time, gathering an abundance of goldfinch dainties.

Its notes are similar to those of the thistle-birds. "The ordinary note is a plaintive mellow, whistling call, impossible to describe and so inflected as to produce a very mournful effect." While pursuing its undulating flight, it utters a sweet song which is in harmony with the rise and fall of its onward motion and is indicative of its sweet disposition. Its nest is a dainty structure built of fine bark and other vegetable fibers, fine grasses and moss compactly bound together and quite thickly lined with plant down.



FROM COL. CHI. ACADEM. SCIENCES.

ARKANSAS GOLDFINCH.
(*Spinus psaltria*).
Life-size.

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TRAGEDY IN BIRD LIFE.

For the friends of birds there are, in cold days of wind and storm, opportunities of loving service.

In the drama of bird-life the scenes are ever shifting, and struggle for existence is not always under sun-lighted, genial skies.

It is true that creative love has endowed the birds with facilities for resisting the havoc of storms. The feathered tribes, nested in chosen coverts, defy the elements and shake out their plumage in fearless defiance of tempests before which man stands in dismay.

A little bit of feathered anatomy will sway cheerily on unprotected twigs, disdaining the shelter close at hand, while the storm beats on wayside.

The endurance of these creatures of the air may well astonish men, who, with all their vitality and size, succumb, of necessity, to the warring elements.

But, in spite of their powers of endurance, the storm-periods are for the birds bitter intervals of life, when hunger and thirst and cold combine to sweep them into the vortex of the lost.

It is not the cold, unaccompanied by other influences, which devastates the ranks of the birds during extreme winter storm-periods, however; it is, chiefly, the dearth of food.

While the harvest of seeds over the meadows is available the bleak blast moans about our birds innoxiously; but it is when the feathery snowflakes cover this well-stocked granary, clinging about the seed-vessels of weed and flower, and closing it in a frozen locker, or the ice-storm wraps it in glittering ice, that the birds are beaten before the winds, and perish of cold and starvation.

There are few, if any, bird lovers who have not some scene of tragedy to recount; some memory of storm-periods when the birds flew to the habitations of men for help, finding no hope but in the fragments cast away by some human hand.

That more thought is not given to the needs of the birds about our doors, at such periods, is due more to the prevailing impression that the birds have the means of

providing, even in times of emergency, for their own needs, than to a disregard of the interests of these little friends of the air.

Unless we have awakened to pathetic struggle of bird life under some conditions we are not apt to be aroused to any obligation in the matter of aiding in providing for birds in seasons of peril.

But it is true, nevertheless, that the little visitor upon our doorsill who stays with us during the long winter suffers the anguish of cold and hunger, frequently of starvation, during the periods of intense cold and storm—anguish which might be prevented by a little thoughtfulness on man's part, in casting a trifle of food in sheltered nooks—crumbs from the table; cracked corn or coarse meal; cracked nuts; a bit of suet, the latter being best served by being nailed upon some neighboring tree, high enough to be beyond the reach of any but the intended guests.

By such provision one phase of the tragedy of bird-life would be abated, and the friendliness of the little strangers developed, to the pleasure of many bird lovers, who would receive in return for their kindness the gladness sure to be theirs in watching the feast of the joyous birds.

The day when earth and sky meet in one maze of blinding snow, or in the mist of rain which freezes where it falls, is hard enough for the birds; but while there is light there is also a hope of a scanty meal to be caught somewhere through the swirl of the storm. But, when this hope fails and darkness lowers into deepening night; when bleak winds rage on every side; the forests creak and moan; the tormented air sobs and wails like a tortured soul; when every sound is swept into the cadence of despair and the outposts of hills are lost in the labyrinth of tumultuous night, then how bitter is life's tragedy for the hunger-racked birds; how marvelous it is that so many little storm-beaten breasts survive to meet the struggle for existence at the dawn of a new storm-beaten day.

GEORGE KLINGLE.

THE LIFE OF AIRY WINGS.

One beautiful day last May my mother laid a tiny green egg on the under side of a leaf on a milkweed plant. I know that its color was green and that it was laid on the back of the leaf because Mother Milkweed Butterfly did not want any fly or worm to eat me up, so she made its green like the leaf and hid it away in a safe place. There I rested quietly within the egg for about four days, when I burst open the shell to see what was out in the world.

I shook myself and found that I could crawl. I was also very hungry. I had come out a green caterpillar with a black head. How strange that was! Now I expected to be a butterfly with wings to sail through the air. Never mind, I thought, if I am a caterpillar I must do all that a caterpillar ought to do, and not make a fuss because I am not a handsome butterfly.

The first thing a caterpillar has to do is to eat his eggshell so that the ichneumon fly—the fellow is an enemy to my family—will not be able to find any traces of him on the leaf. Where did I learn that? I think Mother B. must have folded that thought in the eggshell, for it came out with me. After doing that duty I was so hungry that I ate the leaf on which I found myself, all day long and far into the night. Then I curled up and went to sleep feeling very quiet and comfortable.

When I awakened the sun was up. I was warm and hungry, so I began to eat again. Suddenly I heard a buzzing noise overhead. Oh, dear me! I was frightened and kept perfectly still, for I thought it was that miserable fly after me, but it proved to be only a jolly bumble-bee, and I went on eating.

After several days of this life—eating, and watching for enemies—something happened. I suppose that I had eaten so much milkweed that my skin got too tight to hold me, for it felt very uncom-

fortable and then began to crack. I had spun a little silk on the leaf to get a better foot-hold and remained very quiet for I did not feel like moving. I stretched my head a little, after awhile, and the old head-case came off, falling to the ground. Then I made violent exertions, or movements, with the muscles of my body, and finally the old skin came off. I was very much fatigued and was quiescent, not caring to stir, for several hours. I thought of the fly too, that might sting me now while my new jacket was soft, and that kept me still also. When it became harder I had to eat up the old one, and then was hungry as ever.

Eat! Why I did nothing for about four weeks but devour milkweed, keep a watch out for enemies and grow too big for my jacket. I moulted four times in all, and at the end you should have seen me. My body was striped yellow, black and green, and was nearly two inches long. My head was black-banded; my face yellow with two parallel black bows, and I had two pairs of long slender, flexible filaments, like a hair, on my body.

I had grown so large and strong that I wanted to see more of the world. I crawled off my leaf, down the stalk of the plant onto the ground. What a queer sensation it was, to be sure, to feel the grass and the ground! There was a rail-fence near my old home. I began to feel very weary and sleepy. I crept cautiously along until I reached the fence; crawled up to next the top rail and under it to rest awhile. My, how tired I was! I did not want anything to eat. I did not care to move, nor to speak. I caught hold of the rail and hung there for about twelve days.

I have learned since, that I was a chrysalis and was a beautiful object of emerald green, with gold and black dots.

I was fastened to the fence-rail by a slender shining black peduncle, or stem. Nothing disturbed me, and on the eleventh day the bright green disappeared, the golden spots faded, and on the twelfth day I burst open the shell of the chrysalis, found that I had wings and sailed away through the air. How delightful! So much easier than crawling. At last I was a butterfly. This is what patience and perseverance does for the "ugly duckling," at least that is what a friend on the milkweed leaf told me one day.

I saw another butterfly a short distance ahead of me having the same colors I had—yellow and black with white dots on the wings—and I flew faster to catch up with her. She was very beautiful and knew more of the world than I did, therefore I determined to keep close to her. I found her very modest and unassuming. She made me feel as if I knew it all, and that is the chief qualification that even a butterfly wants in a wife. After a little hesitation I asked her to be my mate. She said she would, and away we raced in the sunshine to a field of clover. She showed me how to get honey out of the flowers with my tongue, which is like a watch-spring coiled up in the lower part of my head. When I am excited in probing to the bottom of a flower it uncoils and half coils again, "acting like a little force-pump" to bring up the juice of the flower.

My mate and I had a jolly time flying over the clover-field, where we met more of our family, the milkweed butterflies, and others. The flowers we like best are the clover, milkweed, goldenrod, thistle and phlox.

I soon discovered that birds and insects did not trouble us much, because we do not suit their appetites. They say that we taste bitter and disagreeable, like the milkweed, so they seldom disturb us, and we lead a happy-go-lucky

life. We often spread our wings wide and float along in the air with little fear of foes. They see our colors—yellow and black, the badge of the milkweed butterfly—and off they go seeking a choicer tidbit.

Whenever there is a heavy wind storm I fly out to battle with it. What fun to have the angry wind hurl you back—only to get your wings fluttering again, and flying a distance to meet another fling! It is great sport.

I must tell you of something that happened to my mate one day. She was flying near a piazza where there were some phlox plants. She darted down towards them, keeping an eye out on a sparrow that had been flying after her, when her right wing caught in a spider-web that was in the piazza rail. She fluttered and fluttered, frightening the spider out of his web, until she got her wing loose; but it was not so strong after that, as a little piece was torn off.

I saw some beautiful flowers lying on a table on the same piazza soon afterwards and, as no one was out there, winged down on them. Queer: they had no honey in them. A little girl in the window exclaimed, "Oh, sister! a butterfly is on our paper flowers."

Then a boy sprang out with a hat in his hand and I flew quickly away. My mate and I were so terrified that we did not go near that piazza again.

The lovely warm summer passed very soon and I had such a happy time that I was sorry when our family flocked together and began to talk of going South in September. We held our meetings on the underside of the branches of trees and, perhaps, some of you saw us there.

Oh! the life of a butterfly is sweet, and there is just enough excitement in keeping out of the reach of enemies to make the struggle for existence interesting.

M. EVELYN LINCOLN.

THE CELESTIAL BIRD.

The ancients called the eagle the celestial bird because it flies high with its eye fixed on the sun.

According to the myths of the birds they are older than the gods and to them mankind is deeply indebted; for the hawk created man, the wren, and not Prometheus, brought down fire for his use, the crow taught him marital laws, while the eagle gave him the brew from the fountain of song. Just why the eagle—who is no musician—should have interested himself in this way, legend does not explain, but, as he is of majestic appearance, and imperial in character, there can be no possible objection to his acting as cup-bearer to the poets! They all like him—or, at least, like to describe him. Tennyson says—

He clasps the crag with crooked hands
Close to the sun in lonely lands
Ring'd with the azure world he stands.
The wrinkled sea beneath him crawls,
He watches from his northern walls,
And like a thunderbolt he falls.

But the eagle takes part in the affairs of birds and beasts, as well as in those of men, for, according to an oriental legend, in ancient times beasts and birds were at war with each other. While victory was still uncertain the owl withdrew from the winged army quite prepared to go over to the enemy. But the eagle fought with such valorous prowess that the birds were finally victorious. The owl, seeing this, flew back to join them. But the eagle observed his movements, and forbade him ever again to mix with his subjects or show his face to the sun.

Although the eagle is a bird of prey he is used as a national emblem on Persian, Roman and United States coins. In-

deed, the eagle is often used for heraldic emblems, standards and various emblematic devices. The eagle is cosmopolitan. The so-called bald-eagle takes three years to complete its plumage; it is called the "black" eagle the first year, the "gray" the second and the "bald" the third year, when the white plumage on neck and head, which gives it the name, is complete. After shedding its feathers in the spring, even the old birds assume the appearance of youth, hence David speaks of the "youth which is renewed like the eagle's." An unusual fact in reference to this bird is that the female is said to be larger and braver than the male.

A story is told of a pair of eagles in the New York Zoological Park who made a nest in the root of a tree, in a cavity of the ground and lined it with moss. As no eggs were yet ready the birds brought a smooth round stone to the nest on which they sat, male and female, on alternate days. Some such habit as this may account for the idea of the ancients that the eagle carried stones to her nest to facilitate the laying of her eggs.

The eagle lives to be very old. It is not especially difficult to tame. A young one caught in the Territory could not be bought. The Indian woman who was taming it refused all offers. She said, "Ah-cha-fa-tona wants young eagle, she not want white man's money!"

"Old Abe"—named for Lincoln—was caught and tamed by soldiers during the civil war. He went through the war delighted with battles. One of his feathers, dropped on the battlefield, was framed and now hangs in Washington.

BELLE PAXSON DRURY.

THE BLACK-BELLIED PLOVER.

(*Charadrius squatarola.*)

The Black-bellied Plover is quite cosmopolitan, though its range is practically confined to the northern hemisphere, passing southward in the winter to the West Indies and northern South America and breeding in the far North. Not only is its range extensive, but also its list of common or local names. Some of the better known of these are Whistling Field Plover, May Cock, Beetle-head, Black-breast and Bottle-head. Its large head has given it the name Bull-head and its large, brilliant and expressive dark colored eyes, which in summer are surrounded by a white ring, have led some of its admirers to call it the Ox-eye.

The Black-bellied Plover is grouse-like in appearance and differs from all the other plovers in having a rudimentary hind toe. It varies greatly in the color of its plumage, both with age and with the seasons. As it stands upon the beach, decked in its summer plumage, it is a striking and beautiful bird. As winter approaches its plumage assumes a more somber hue and becomes a mixture of dark brown and gray above, while below the plumage is white with lines and spots of dark brown on the neck and breast.

This bird is one of the largest of the plover species. It will run rapidly for a few yards and suddenly stopping will elevate its head and closely survey its environment. The older birds are shy, but the younger ones will quite readily respond to the call of the hunter and will usually approach his decoys. Its call notes are of two kinds. One is loud and penetrating and may be heard at a long distance. This call consists of a number of distinct notes, the second of which is accented. The notes of the other call are uttered in a low and satisfied tone as if the bird were perfectly contented. Mr. George H. Mackay found much to admire

in the life of this Plover. He says: "There is something very aristocratic in the bearing of the adult birds as you watch them standing on the marsh with their heads erect, their black and white plumage strikingly defined, and their large, dark, liquid eyes ever on the alert for danger. With the yellowish green marsh grass for a background, they make a most interesting study in black and white, which, coupled with that clear penetrating note of alarm when danger is discovered, cannot fail to impress one."

When migrating it may fly alone or in flocks. At times the flocks will assume a wedge-shaped or a crescent-like form. The latter seems to be the more common form, and the ends of the crescent may point either forward or backward. The solitary birds are more frequent in the interior, while the flocks are more common near the sea coast. The slow and measured stroke of the long wings is well fitted to a continuous and prolonged flight. When tired from flying at sea it will rest on masses of seaweed or float upon the water.

The Black-bellied Plover feeds largely on minute mollusks, shrimps, worms, sea insects and on various larvae found in the marshes. It also eats grasshoppers and late in the season, at the North, berries form a large part of its diet. It is at this time that its flesh is most eagerly sought by the connoisseur of game food. Food is gathered with a quick stroke and from the surface, for the bird cannot probe for its food as do the sandpipers.

This Plover is a tide bird, "seeking a large portion of its food on those extensive sand flats left by the receding waters, which may be adjacent to marshes where the grass is short, and which are interspersed with barren places where there is no grass, also to uplands and

fields where the grass is scanty or closely fed down by sheep or cattle. It is to such places that they like to resort when driven from their feeding grounds on the sand flats by the incoming tide. They also frequent, at such times, the crest and dry sand of the beaches and shoals;

here they remain until the tide has sufficiently ebbed to permit them again to return to feed."

The Black-bellied Plover gives but little attention to home building. Its nest is a mere depression in the ground lined with grass and leaves.

SOME BIRD WONDERS.

Geologically considered, the migration of birds had its origin in the beginning of the Post-Tertiary period of our globe's history. Prior to the Glacial Epoch there was no migratory instinct among the feathered tribes of the earth's fauna for the simple reason that there was no necessity for such a change of habitat.

Thus the annual recurrence of this phenomenon has been going on not since the creation, as many suppose, but for units of ages whose lapse can be reckoned only by millenniums of calendar years. It is not the time and place here to discuss the means by which this length of time can be even approximately determined, but there are certain inferences and conclusions which are well endorsed by scientific research.

For our present purpose it is quite sufficient to say that the Glacial Epoch wholly changed the climatic relations of the polar and middle latitude regions of our globe. From the semitropical conditions which once perennially existed there, these regions have since and for ages been subject to the intense cold which now periodically prevails within those limits.

There is a growing conviction among geologists, that the intense cold of the Glacial Epoch was caused by a change in the eccentricity of the earth's orbit. If this be true, then the "Great Winter" of astronomers was reigning in all its severity 210,000 years ago.

The wild goose, his near relatives, the

brant and swan, and other aquatic feathered races, made their appearance on the fifth day of creation. "And God said, Let the waters bring forth abundantly the moving creature that hath life, and fowl that may fly above the earth in the open firmament of heaven."

Now this fifth day of creation very nearly corresponds to the Triassic and Jurassic periods of Mesozoic Time in Geology.

Although "every winged fowl after his kind" is included in the bird category of this creative act, it has been thought, and for good reasons, that the more highly organized birds other than the aquatic tribes, did not make their appearance till the sixth day of the Mosaic account, which would be exactly represented by the Tertiary Period of Cenozoic Time. According to this view, then, the wild goose is an older denizen of our world than the smaller birds of passage which make their home on the land only.

But Geology fills up many niches and supplies many details left blank in the first chapter of Genesis. It is now one of the firmly established tenets among geologists that between the Mesozoic and Cenozoic times there came a tremendous disturbance in the earth's crust.

In his "Story of the Earth," Dr. J. Dorman Steele says, "The Mesozoic time, like the Palaeozoic, was closed by mighty upheavals. The conditions of life were changed. All the Mesozoic types disappeared; hardly any species

survived the shock." A few individuals did survive, however, and among them was our venerable friend, the wild goose.

Having now finished the prefatory portion of our story, the reader will be better able to understand what may follow.

There is something wonderful, a conception, indeed, which smacks little short of the sublime in contemplating the protracted journeyings of the larger aquatic birds of passage. Especially is this true of the American wild goose, the brant and the swan. The brant is the wild goose of Great Britain and continental Europe; a much smaller bird than his American relative; and its migrations are of comparatively short range.

The European domesticated swan, remains, of course, the year round in the country of his adoption.

Not so, however, with the American goose and swan. Both the former, *Anseres hiperboreas*, and the latter, *Cygnus buccinator*, rear their young in the Arctic regions and spend the succeeding winter with their offspring in the Gulf States and Central America.

Think of these magnificent birds, those on the Pacific coast flying from the shores of the Arctic ocean in northern Alaska and British America, crossing the Rocky Mountains, and, after a journey of four or five thousand miles, complacently settling down in Texas, Mexico, Yucutan, or Nicaragua, as the experienced leaders may determine. Then turn to those on the Atlantic side of the continent and watch them as they leave the Baffin's Bay country, cross the great lakes and the Appalachian mountain system to make a short winter sojourn among the everglades of southern Florida.

In the tactics of these great birds while performing their immense journeys there is something remarkable even to the casual observer. More than two thousand years ago it was recorded by a student of natural history that, "*Olores iter facientes colla imponunt praecedentibus; fessos duces ad terga recipiunt.*"

"Swans performing a journey rest their necks upon those preceding; and the leaders receive the weary ones upon their backs."

And this significant remark has often been confirmed by modern observation.

Owing to the fact that they are more sparsely distributed, that they fly much higher and in smaller numbers than wild geese, the swans are comparatively seldom seen during their migratory flights save in the fastnesses of mountainous districts or at the extreme points of arrival and departure. Hence we see why so little is known concerning the details of their aerial movements.

On the contrary, the semi-annual passage of wild geese is not only a folk-lore phenomenon, but a familiar spectacle to the residents of cities and towns as well as those who spend their days in the rural districts. Now, there is more military precision in the alignment of a large flock of wild geese than the most careful observer ever dreamed of or science investigated.

Here in the fastnesses of our Rocky Mountains there are many exceptionally good opportunities for watching the marvelous evolutions of these birds.

While their flight may be a mile high or more when spanning a level scope of country, as in the prairie districts, they barely clear the more elevated peaks while crossing lofty mountain ranges. Hence it will be seen that an observer on either slope is much nearer the passing birds than an inhabitant of the lower levels or plains.

The well known acute angled form assumed by wild geese in their annual journeys is not a mere fortuitous conceit on the part of the birds, but a true pattern of that diagram formulated by the anserine leaders of long ago prehistoric ages; brave old heroes that piloted their snowy hosts over the storm-lashed wastes of northern latitudes while frost and fire and glacier and drift were so radically changing the topography of our globe.

It can be shown that this particular form of alignment in the flight of geese is just as essential to the convenience and vital interests of the birds as the hexagonal form of honeycomb cells is to the bees that construct and fill them with honey. Nay, it is also true that no other form of alignment in flight could fulfill the conditions required; but we cannot here explain the principles involved in the interesting discussion.

L. PHILO VENEN.

THE DIAMOND.

The Diamond is generally conceded to be the most beautiful as it is the most important of precious stones. While other stones at times exceed it in value, weight for weight, in total importance as an article of commerce other gems are hardly to be compared with it. Out of thirteen and one-half millions of dollars' worth of precious stones imported into the United States in 1900, twelve million dollars' worth were Diamonds. Not all this amount was employed for jewelry, since there is a large utilization of the stone for industrial purposes, but even for jewelry the Diamond has a largely preponderating use. Its points of superiority are its hardness, high refractive powers and hence play of colors, its transparency and its luster. In all these qualities it excels any other known mineral. Hence when in addition to these it exhibits different body colors, as is sometimes the case, no other gem can equal it in value.

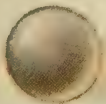
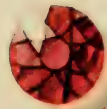
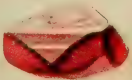
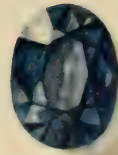
Usually the Diamond is colorless or white, although shades of yellow are also common. It is also known in shades of red, green and blue and in brown and black. The two latter are rarely transparent and grade into the varieties known as bort and carbonado, which have no value as gems but are highly important for industrial purposes.

In composition the Diamond is pure carbon, thus not differing chemically from graphite or such forms of carbon as lamp-black, bone-black, etc. It is crystallized, but this can be said of graphite as well. Why carbon should assume the form of Diamond in one case and graphite in another, as well as being amorphous in other occurrences, is not known. Such behavior of a substance is known as dimorphism, and numerous illustrations of it are to be found in Nature.

Being pure carbon, Diamond can be burned in the air. The finely divided

dust can be burned in the ordinary blow-pipe flame, and for stones of ordinary size a temperature of about 900° C is sufficient. The possibility of consuming the Diamond by heat is said first to have been suggested by Sir Isaac Newton, who reasoned from the high refractive index of the stone that it was "an unctuous substance coagulated," and hence probably combustible. Following this suggestion two Italians, Averi and Targioni, succeeded in 1695 in burning some Diamonds in a furnace, and since then the experiment has been repeated many times. The Diamond does not fuse in burning, but after becoming heated to redness gradually grows smaller, emitting sparks, till it entirely disappears. It leaves no ash except in the case of the impure form known as carbonado. The gas given off has been collected and analyzed and found to be carbon dioxide just as would result from the combustion of other forms of carbon. If protected from the air or free oxygen, the Diamond can be exposed to high heat without change.

Being a crystallized substance and excessively hard the Diamond is usually found in the form of more or less perfect crystals. These have forms such as the cube, octahedron, etc., which belong to the isometric system, and it is in this system that the Diamond crystallizes. The crystals do not possess, however, the highest isometric symmetry, but belong to the class designated by Groth as hexakistetrahedral, being tetrahedral with inclined face hemihedrim. It is very common for the faces to be curved instead of flat and to show etching figures of various kinds. The crystals are often considerably distorted so as to produce pointed and rounded forms, and twin crystals are common. Although so excessively hard the edges of the crystals as found in the beds of streams are often rounded from the wear of the other peb-



DIAMOND AND CORUNDUM.

Sapphire Crystal.
Ruby Crystal.

Diamond in Matrix (Brazil).

Cut Sapphire.
Cut Ruby.

Bort.

Diamond in Matrix (South Africa).

Black Diamond, Carbonado (Brazil)

Spinel Crystal, Rubicelle.

Spinel Crystal, Balas-ruby.

bles, probably chiefly quartz. Only the wear of centuries could produce such a result, however, for, as is well known, it is only with its own dust that the Diamond can be abraded to any appreciable degree by any of the means now used for cutting it.

One important property of crystallized Diamond is that of cleavage parallel to the faces of the octahedron. This cleavage is of much service in preparing the gem for cutting, as by taking advantage of it, broad, flat surfaces can be obtained without grinding. This property also distinguishes Diamond from quartz, for which its crystals as found in sands are sometimes mistaken. Quartz has no cleavage. The fracture of the two minerals is the same, however, being conchoidal.

The massive forms of the Diamond known as bort and carbonado possess little or no cleavage, thus increasing their value as abrasives and for setting in drills, saws, etc. The true bort occurs as rounded forms made up of a confused aggregate of crystals and is harder than ordinary Diamond. Fragments of crystals of no value as gems or any crude Diamond dust are also known as bort in trade. Carbonado is a name given to black Diamond which has more or less crystalline structure. This graduates into the crystallized mineral. Either of these is more valuable than the crystallized Diamond for industrial purposes, although of no value as gems.

As already noted, Diamond occurs of various colors, about half the stones found being tinged to some degree. If the color is but slight, the stone is considered less valuable than if perfectly colorless, but a Diamond of pronounced color is the most valuable gem known.

Among colors of Diamonds, blue is the rarest. The largest and most valuable colored Diamond known is the Hope Blue, weighing $44\frac{1}{2}$ carats. This is valued at about one hundred thousand dollars. It has a brilliant deep blue color and is without a flaw. A deep blue Diamond weighing 67 2-16 carats was long worn in the French crown, but it was stolen in 1792 and has never been recovered. Red Diamonds vary in hue from ruby red to rose, the latter being the most common.

No large red Diamonds are known, the largest being one of 32 carats in Vienna. Another famous one is that in the Russian treasury, for which Paul I paid one hundred thousand roubles. It is of a ruby color. The finest green Diamond known is the "Dresden Green" preserved in the Green Vaults of Saxony. It was purchased by August the Strong in 1743 for sixty thousand dollars. It is apple green in color and weighs 40 carats. Diamonds of yellow color are comparatively common, many of the Cape Diamonds being lowered in value by possessing a yellow tinge. It is said that this injurious yellow tinge can be overcome by dipping the stone several times in a solution of potassium permanganate, the violet color of the latter neutralizing the yellow of the Diamond. The yellow tinge usually also disappears in artificial light. Of large Diamonds possessing a yellow color the Florentine and the Tiffany are the best known. The color of colored Diamonds is generally permanent, but that of some is said to fade on exposure to light. It can also be destroyed or changed by heat.

The luster of the Diamond is a peculiar one, and such as is possessed by few other minerals. In reference to its occurrence in the Diamond it is known as the adamantine luster. It combines the peculiarity of an oily luster with that of glass and that of a metal. It is doubtless due to the high refractive power of the mineral, which causes more than the ordinary number of rays of light to come to the eye. In the impure forms of Diamond the greasy or oily luster becomes more pronounced. Once the eye becomes accustomed to the peculiar luster of Diamond the stone may easily be distinguished by it from glass or minerals with a vitreous luster, such as quartz. Certain other minerals, however, such as cerussite, zircon, and to some extent sphene, exhibit the adamantine luster. In the glass known as strass, used to make imitation Diamonds, the adamantine luster is well imitated.

Diamond is usually transparent, but it may be translucent and even opaque, especially the black varieties. Even otherwise transparent Diamond often contains inclusions which cloud and interrupt its clearness. These constitute the "flaws"

which so often injure the value of a Diamond and prevent it from being of the "first water." These inclusions may be simply small cavities, sometimes so numerous as to make the stone nearly black, or they may be particles of other minerals, such as chlorite, hematite or carbonaceous matter. If the latter, the flaws can sometimes be burned out by careful heating.

As already remarked, the refractive power of the Diamond is very high. The rays of light entering it are bent at a high angle, causing a large degree of what is called total reflection within the stone. The effect of this is to light the stone's interior. Moreover, the rays of light are concentrated on a smaller part of the surface than is the case with less highly refracting minerals and thus also internal illumination is produced. The most important result of the high refractive power of the Diamond is the wide dispersion of the spectrum, causing the red rays to be widely separated from the blue rays and strong lights of one color to be transmitted to the eye as could not be the case were the different rays less widely separated. It is this power of flashing different colored lights which gives the Diamond one of its chief charms. The index of refraction ranges from 2.40 for the red rays to 2.46 for the violet rays. Ordinary glass has an index of refraction for the red rays of only 1.52 and for the violet 1.54, making the spectrum only about half as long as that produced by the Diamond.

Another pleasing property of the Diamond is the fact that it is usually more brilliant by artificial light than by natural, although some individual stones have a reverse behavior.

Diamond is much the hardest substance known in Nature, and as the proverb says only the Diamond is able to "cut Diamond." It is ranked 10 in the scale of hardness on which minerals are classified, corundum being the next below it. It is really separated by a wide gap from the latter mineral, however, and its hardness is as much greater than that of corundum as that of corundum is greater than that of the first mineral in the scale. This hardness of Diamond affords a ready means of identifying it, as it will scratch all other substances. It is popu-

larly supposed that Diamond is the only mineral which will scratch glass to any extent, and a stone found is often reported to be Diamond because it will do this. As a matter of fact, however, all quartz will scratch glass and the harder minerals, garnet, topaz, beryl and others will do so easily. Minerals which will scratch glass are therefore common. The Diamond cuts glass instead of scratching it, and is the only mineral that will do this. Although the Diamond is so hard, it is not tough, and can be easily broken with the blow of a hammer. It was a tradition of the ancients that if a Diamond were put upon an anvil and struck with a hammer, both hammer and anvil would be shattered without injuring the Diamond in the least. One occasionally hears this statement made even at the present day. It is entirely untrue, however, the Diamond being as brittle as at least the average of crystallized minerals. The specific gravity of the Diamond is about three and one-half times that of water, determinations showing variations between 3.49 and 3.53. Carbonado is lower, ranging between 3.14 and 3.41. Diamond is thus a comparatively heavy mineral, the only ones among the gems which much exceed it in specific weight being hyacinth, garnet, ruby, sapphire and chrysoberyl.

Diamond becomes strongly electric on friction so that it will pick up pieces of paper and other light substances. It does not retain its electricity long, however, usually not over half an hour. It is not a conductor of electricity, differing in this respect from graphite, which is a good conductor. Diamond becomes phosphorescent on rubbing with a cloth, giving out a light which is visible in the dark. Some stones emit such a light after being exposed to the sun's rays for a time, as if they took it up from the sun and gave it out again. This has often been stated to be a property of all Diamond, but this is not true, only certain stones exhibiting it. As first suggested by Mr. Geo. F. Kunz, it is probable that this phosphorescence is due to minute quantities of hydrocarbons which emit light on being heated by the friction given the stone. It is curious to note that the light is in some cases given out only from certain crystal faces of the stone. Thus Dia-

monds are known which give out light from the cubic faces but not from the octahedral, while others are reported as giving out light of different colors from different faces.

The name Diamond comes from the Greek *adamas*, which means unconquerable. This term was doubtless applied because of the great resistant power assigned to it by the ancients. Besides the well known tradition that it could not be broken by hammer and anvil, they believed that it could be subdued or broken down only when dipped in warm goat's blood. Our words *adamant* and *adamantine* are also derived from *adamas*, the latter term still being used to describe the luster of the Diamond. The change of *adamas* into the word *Diamond* is thought by some to have come from prefixing to it the Italian *diafano*, transparent, in allusion to its possessing this property.

According to classical mythology the Diamond was first formed by Jupiter, who turned into stone a man known as Diamond of Crete, for refusing to forget him after he had ordered all men to do so. Many medicinal virtues were ascribed to the Diamond, it being regarded as an antidote for poisons and a preventive of mania.

The world's supply of Diamonds has come almost wholly from three countries—India, Brazil and South Africa. Up to the beginning of the eighteenth century India was the only source of Diamonds known. The Diamond fields of India occur chiefly in the eastern and southern portions of the peninsula. The famed region of Golconda is in the southern part. This is the territory whence have come the most celebrated Indian stones, such as the Kohinoor and the Hope Blue. The French traveler Tavernier reported when he was there in 1665, that sixty thousand men were then employed in these mines. Now the mines have all been given up and the region is abandoned.

The present yield of Indian Diamonds comes almost wholly from mines in a district south of Allahabad and Benares. The Diamonds occur here, as universally in India, in a conglomerate or sandstone made up of the remains of older rocks.

The mines are worked almost wholly

by natives of the lower caste, attempts of Europeans to conduct the mining not having met with success. The natives separate the Diamonds by washing, or where the rock is too hard for such methods, break it up by heating and throwing cold water upon it. The production of Diamonds from all of India is at the present time very small, not reaching a million dollars a year in value. It is likely in time to disappear altogether since most of the old mines have been abandoned and even their location forgotten and the returns from the present mines are not very profitable.

The Brazilian Diamond fields were the first important ones to become known after those of India. Diamonds were first found here in 1729 in river sands which were being worked for gold by adventurers who penetrated into the region from the coast. The gold miners paid no attention to the bright crystals sometimes seen in the bottoms of their pans, but a monk who had seen Diamonds mined in India recognized them as gems indeed. While for many years the Diamonds obtained came wholly from the river sands, later, upland deposits were discovered which now afford a part of the supply. Diamonds have been found in the following provinces of Brazil: Bahia, Goyaz, Matto Grosso, Minas Geraes and Parana. In all except Bahia and Minas Geraes the mining is desultory and consists simply in washing river sands by means of wooden bowls. Enough Diamonds are thus obtained to afford a precarious living to the *garimpos*, as they are called, who follow this occupation. The chief Diamond bearing region of Brazil at the present time is in the province of Minas Geraes, centered about the city of Diamantina. The black variety of Diamond known as *carbonado* comes chiefly from the province of Bahia and is in large demand for industrial purposes. The Brazilian Diamonds are as a rule small, but exceed all others in luster. The largest Brazilian Diamond known is that named *Star of the South*, which weighed in the rough 254.5 carats and was valued at one hundred and seventy-five thousand dollars.

As is generally known the chief source of Diamonds at the present time is South Africa. As in Brazil, Diamonds were

first discovered here in the river sands and these still afford a small supply. These were first known in 1867, but in 1871 the deposits in place near Kimberley were found and these constitute today the world's great Diamond mines. The mines now being worked are four in number, and all occur within an area hardly three miles square. Geologically the formation seems to be that of a filling of old volcanic necks by an influx of mud from below. It is this mud which now considerably hardened contains the Diamonds. The largest Diamonds of the world have been obtained from these mines, some exceeding the Kohinoor in size. Their quality is also generally good, although sometimes injured by a yellow tinge.

Besides the above countries, Diamonds have been found in Australia, the Ural Mountains, British Guiana and the United States. The finds have usually been in the beds of streams and are not of sufficient abundance to make systematic mining profitable. The localities where Diamonds have been found in the State of Wisconsin, in this country, are on the terminus of a moraine which came from the North, somewhere in the region of Hudson's Bay. It is hence not improbable that the "mother lode" will some day be found there.

Finally it is interesting to know that Diamonds occur in meteorites, and hence doubtless exist in other worlds than ours.

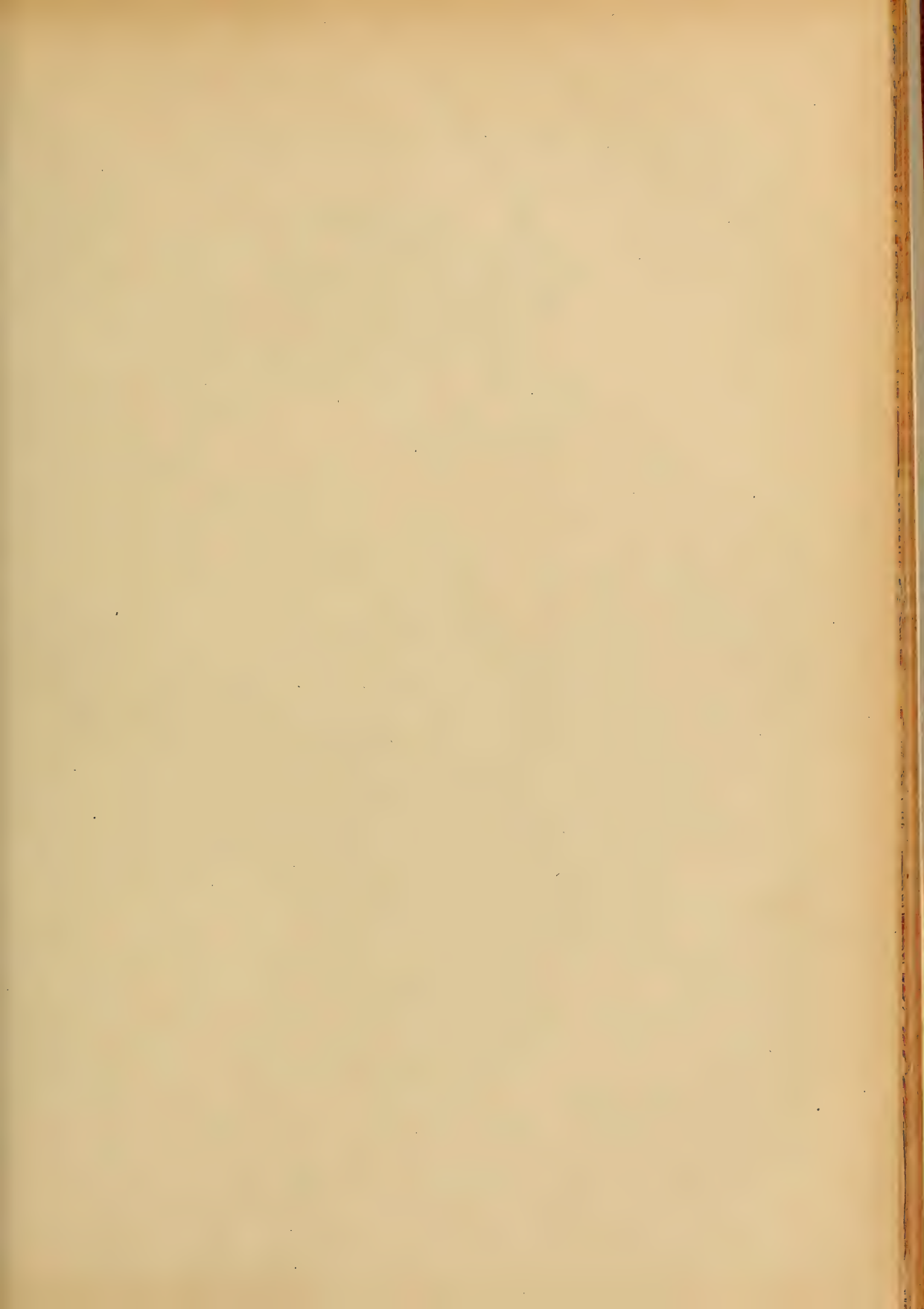
OLIVER CUMMINGS FARRINGTON.

INDIAN SUMMER.

With your hazv distances,
And your fine insistences,
Of russet, amber, brown,
From what region dost thou journey
Hither to our fields a-tourney,
Flinging thy dim gauntlet down?
Dost thou come from Southern seas?
Or from mountain fastnesses?

Ho, we call thee Indian Summer,
O thou late and languid comer,
Loitering our forest aisles;
Idling with the sunshine dreamy,
As with wandering a-weary,
Chary, ever, of thy smiles.
Thou hast come to claim the glamour
Of the dear, departed Summer.

—M. D. TOLMAN.





THE HORNED TOADS.

The Horned Toads form an interesting group of Lizards which are related to the iguanas of the tropical forests of America. They are, however, terrestrial lizards, inhabiting the plains of Southwestern United States and Mexico. Their short, broad and more or less flattened bodies, rounded heads and short tails give these animals quite a striking resemblance to the common toad. Hence their common name. In one respect, however, they are not at all like the toad. The head is armed behind with a row of quite formidable horny spines, and in some of the species shorter ones are also present on the top of the head and on various parts of the body. As these lizards are slow in motion, the horns constitute one of their chief means of defense. When in the presence of an enemy "the muzzle is depressed and the horns are elevated. The back is also arched." The utility of the horns as a means of defense has been amply proven. The dead bodies of snakes have been found with the horns protruding through the skin of the body near the head. But this is not their only means of defense. From birds they are protected by their coloration, which is a somber mixture of brown, black and yellowish, and when quietly resting on sands or rocks in the open they quite closely resemble stones covered with lichens of varying shades of color. Abundant as they are in some arid regions of the Southwest, they frequently escape the notice of the observer because of their coloration. In such regions, too, they can take refuge beneath the protecting spines of the Agaves and the branches of the prickly Opuntias. Dr. Leonhard Stejneger considers the Horned Toads a most striking illustration of protective mimicry. Of one species he says: "In the cedar and pine belts of the San Francisco Mountains the dark color of the soil and stones covering the surface is closely matched by the

ground color of the Horned Toad, while the greenish gray and orange-colored markings which somewhat irregularly adorn their backs are perfect imitations of the lichens covering the rocks and pebbles among which these odd looking creatures live. Near the rim of the Grand Canyon of the Colorado, on the other hand, the ground is covered with small pebbles of variously colored sandstone, ranging from a clayey white to brick red and dark brown, and the specimen which I collected there is such a faithful reproduction of the surroundings that it would undoubtedly have remained undetected had it not been moving. Even more remarkable are the specimens which Dr. Merriam collected in the black lava belt. One of these was brought to camp alive." Dr. Stejneger made a careful study of this specimen and found that it had very closely imitated the color of the lava, including even its glossy appearance.

One of the most remarkable habits of at least one of the species, and possibly of all the Horned Toads, is the power of ejecting jets of blood from the eyes. This power is rarely exercised and seemingly only when greatly irritated. Professor L. M. Underwood relates the following instance, which also illustrates some of the other habits of the Horned Toads when angered: "In 1885 a student of mine received a specimen of Horned Toad from California. In examining the animal I took occasion to turn him on his back, using a lead pencil for the purpose. The animal resented this treatment and showed considerable anger, opening his mouth and puffing up his body. Irritating the animal still more, he grew more and more enraged, until finally blood spurted from just above his eye, which was fired at least a foot from the animal, as several spots struck my arm considerably above my wrist. After spurting the blood the toad became limp and col-

lapsed, and remained in a stupor for some time, and, when handled, behaved as if dead. After a time, possibly not over five or six minutes, certainly not over ten, the animal revived and commenced to run about the table." Irritating him again in the same manner, Professor Underwood caused the toad to go through the operation a second time, which was followed, as in the first instance, by collapse and stupor. "No amount of irritation could produce a third discharge, although the animal showed some anger."

This habit of the Horned Toads has been observed by a number of scientists and it is said that the Mexicans have called them Sacred Toads, "because they wept tears of blood." An examination with a microscope clearly shows that the ejected liquid is blood. As to the purpose of this habit, Dr. O. P. Hay says: "It appears to me quite likely that it is done in order to defend itself from the attacks of its enemies, although it would not seem likely that blood would hurt the eyes much. Nevertheless a discharge of blood into the eyes of some persever-

ing bird or snake might so seriously interfere with its clearness of vision that the lizard might make its escape while the enemy was wiping its eyes." One investigator, at least, has had the experience of having the stream of blood enter his eye. It was followed by pain which lasted for some time, but was relieved as soon as the blood was entirely wiped from the eye. Some inflammation followed, but soon it disappeared.

Unlike some of the other lizards, the Horned Toads are not provided with a protrusive tongue. This fact, together with their clumsy form, prevents them from preying on the more lively insects. They chiefly feed upon the beetles and other slowly moving insects that inhabit the region in which they live. The food is captured in the evening, and if undisturbed the toads remain quite passive throughout the day. In captivity they are interesting pets and if they will take food they bear confinement for a long time. "They not infrequently, however, starve themselves to death, though their capacity to live without food is marvelous."

DOWN IN DIXIE-LAND.

One never has to travel very far from home to see something new and interesting; so I wonder if all of the readers know of the "frizzly chicken" which is so popular among the colored people of our southern states.

It is of ordinary size and like the rest of the chicken family, except that its feathers stand on end like the quills of an angry porcupine. It reminded me of a chicken perpetually blown before a March wind. Of course, their feathers become ragged and "frizzled," like the

hair of their proud possessors, and I imagine the motherly inclined do not find their sittings quite so comfortable as do our meek-looking hens.

As a rule, the negroes are very humane in their treatment of domestic animals. The dogs are treated as well as the children, and nearly every cabin door has a hole cut in it for the entrance and exit of the family cats. As the weather is seldom cold, these ventilators are really good for the larger inmates.

LEE McCRAE.

MY BAT.

When I discovered the bat he was hanging by his hind feet, head downward between the blind and the window. I could not see him breathe and thought he must be dead, but he was only sleeping.

We closed the shutters of the blind as softly as we could, but it awoke him, and he began to wiggle and twist. He could not get away and we lowered the window from the top and grabbed the little fellow.

How he did scold and snap his jaws together! His little teeth were sharp and he tried his best to bite us.

We put him in a box and put a piece of coarse wire netting over the top.

Mr. Bat did not enjoy being made a prisoner, and did not quiet down until he found he could hang head downward from the netting.

He was quite a pretty little animal, his body being about two inches long, with soft, thick, reddish brown fur on its upper and under part and on his head. His eyes were small and dark, and his head looked like a tiny bear's, but there was no hair on his ears.

His wings also were without hair and nearly black in color. When hanging by his hind legs he kept his wings folded tightly against his body.

The bat's hind feet were very small, having five tiny toes with the smallest possible nails. By having one toe around the wire of the netting he could hold himself suspended in the air.

The little fellow's mode of walking on the bottom of the box was very awkward. He would thrust forth the claw at the end of one of his wings and hook it into the box, then advance the hind foot and tumble forward, repeating the process with the opposite side, thus tumbling and staggering along, falling first to one side, then to the other.

If he wanted to hang from the netting he would reach up a hind foot and gain a foothold in the side of the box, then raise the other, thus climbing backwards until he could clasp the netting.

In the evening the bat got out of the box and was flying about the room before we knew he had escaped. He flew round and round in a circle, sometimes striking the walls of the room. His wings made considerable noise and he looked many times larger when flying.

We thought we should have to shut him up in the room until morning, but at last succeeded in catching him by hitting and knocking him to the floor with a coat, then throwing it over him.

The little fellow struggled and tried his best to get away, but it was no use. We put him back into the box and put a weight on the netting. He scratched around in the box and scolded all the evening, but he did not get away again.

The next morning I thought he would be hungry and tried to get him to eat and drink. He lapped a little water and a little milk out of a teaspoon, running out his tiny red tongue and making a little hacking noise.

He would not be tempted to eat a fly, shaking his head and spitting the flies out as fast as I could put them into his mouth.

As he would not eat we thought the little fellow would starve if I did not let him go. I waited until evening and took the box outdoors. He was hanging to the netting, and I took it off and turned it over so he could fly. He spread out his wings and away he went, glad to be at liberty once more.

I have looked every morning to see if the bat is hanging against the window, but have not seen him since I set him free.

MARTHA R. FITCH.

THE ATLAS MOTH.

(*Attacus atlas.*)

India is not only noted for its large and ferocious beasts, but also for its gorgeous flowers and beautiful insects. Among these is the splendid Atlas Moth, noted not alone for the extravagance of its coloring, but also for its immense size, for it is the giant of the moths and butterflies. The largest specimen recorded is now in the British Museum. Expanded and measured from tip to tip of the fore wings, it is only one-quarter of inch less than one foot. Measured in the same manner, the specimen of our illustration is a trifle over ten inches. The average expansion, however, is only about eight or nine inches. Its large size influenced Linnaeus to give this moth the specific designation of Atlas, the name of one of the Greek gods, by whom the pillars of heaven were supposed to be supported. In later years the word has been used in a figurative sense indicative of an ability to sustain a great burden. Truly no other name would be more appropriate, for the large wings of the Atlas Moth enable it to fly swiftly and to long distances, though its flight is somewhat erratic.

The larvae or caterpillars of this regal moth are fully as interesting and beautiful as the adult insect. They have a long, thick and fleshy body, which bears several rows of tubercles, crowned with spiny hairs. When young they are black with white spines, but afterwards become a rich green color and bear bluish-green or black spines. It is said that the larvae eat their skins after moulting and it has been suggested that the object of this habit is to prevent the cast off skins from indicating their presence to birds and other enemies.

The Atlas Moth varies considerably in the color of its wings and, when compared with the expanse of its wings, its body is very short. A peculiar and striking characteristic is the large and triangular transparent spot near the center of each of the four wings.

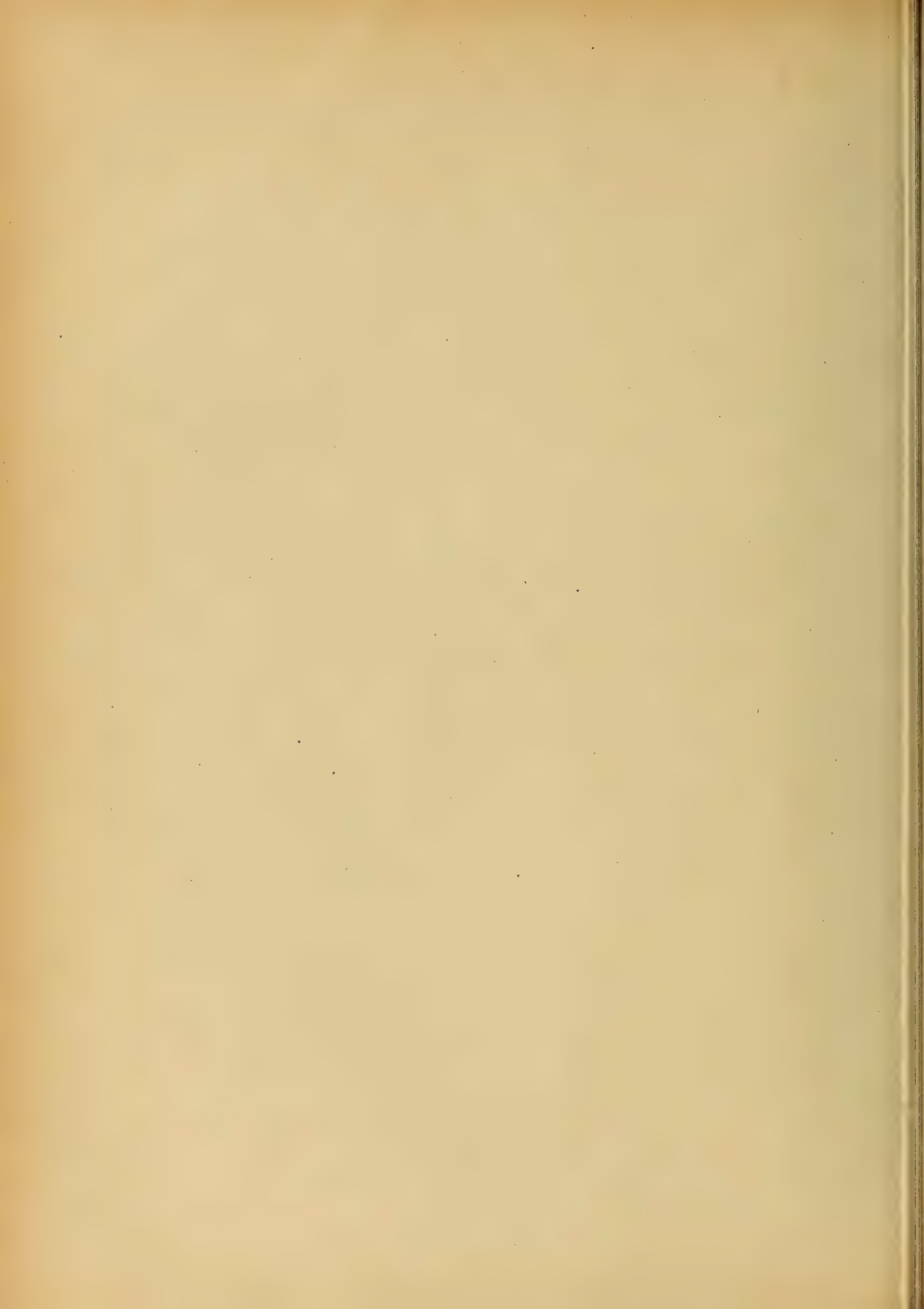
Among its allies are some of the most important of the silk producing moths of India, China and Japan, and the common emperor moth of England. Other species of the genus *Attacus* inhabit Central and South America, but they are much smaller and not as beautiful as the Atlas.

A BUTTERFLY.

Lazily flying
Over the flower-decked prairies, West;
Basking in sunshine till daylight is dying,
And resting all night on Asclepias' breast;
Joyously dancing,
Merrily prancing,
Chasing his lady-love high in the air,
Fluttering gaily,
Frolicking daily,
Free from anxiety, sorrow, and care!

—C. V. RILEY.





WHEN BILLIE CAME BACK.

Billie is the handsomest Flicker that comes to the grove of oaks on the north campus of the college and that is saying a great deal. For several years he has occupied a splendid house hollowed out with much labor in the great oak by the power house. Just above the portico of his house Billie has his xylophone. This remarkable instrument is just seasoned enough and has just the correct spring in its splinters. Here every morning, at this season, he beats a series of tunes, monotonous perhaps, but rather pleasing to Billie and me. After beating a tune, he screams at the top of his voice, "Get up; get up." He is an alarm clock and a great nuisance to those who love their morning nap, but I would not allow him to be disturbed, he seems so business-like and earnest. My wife was disposed to disparage his musical attainments, but when she saw the marvelous rapidity of his strokes and the beauty of his red crest flashing in the slanting sunlight she became a partisan.

It should be said, of course, that after the brief season of courtship is over and Billie's wife is busy about her house-keeping, he is less musical and we do not have our reveille so regularly.

Early last spring a pair of English sparrows took possession of Billie's house and worked with a diligence worthy a better cause to fill it with sticks and bits of straw. I was interested at once and waited eagerly to see what Billie would do when he should return. I did not have many days to wait. One fine day I heard Billie hammering a gay tune. I watched and was soon rewarded. Billie seemed taken aback, but soon recovered from his surprise and proceeded to clean house at a great rate. Meantime the sparrows could do nothing but scold, and I confess to a degree of satisfaction in their discomfiture. For once the speckled little Ishmaelites were impotent.

Finally the last straw was thrown out and Billie perched upon the limb that served as a portico for his house, screamed with defiance and satisfaction. Soon he flew to a distant part of the grove in search of the future Mrs. Flicker, I suppose, and was gone for perhaps an hour. The sparrows worked desperately and had nearly all of the material replaced when Billie, disappointed in his quest and in no very good humor, returned. This time Billie's patience was entirely gone and he threw sticks right and left, stopping occasionally to scream with anger. He seemed to know there would be little use in chasing the pesky sparrows. He did not go far from home after that, so that the sparrows were compelled to go house hunting elsewhere.

Billie mounted guard over his fireside and his altars for several days, treating us to a quantity if not a variety of drum solos, and the seductive notes of his cross cut saw of a voice were in constant evidence. He never knew the sorrow of the human performer of like merit when his best friends are willing for him to rest.

One fine day a demure looking female, attracted by his music, came and critically examined the house. I knew she was already won, but Billie did not, and it was amusing to watch his antics. Did you ever see a Flicker desperately in love? It was evidently love at first sight with Billie. He spread his wings, showed the jet black crescent on his vest, displayed the crimson glory of his crest, played his most catchy tune on the xylophone and sang his most melodious song. Meantime the coy female, already decided, still appeared to be unable to make up her mind. She made as if to go on, and Billie was in despair, and redoubled his persuasion. She had never heard such a tattoo, nor seen such a

xylophone, nor yet so fine a fellow as Billie. Soon she stopped her pretended search for larvae under the loose bark and made another inspection of the house. She exemplified the maxim, "To hesitate is to be lost," and soon she and Billie were busy with their housekeeping. The sparrows got no further chance to occupy Billie's summer home. A happy family was reared and educated and in the autumn disappeared.

As I write Billie has returned and is beating a merry tune, while six or more

sparrows sit around listening as if to learn how. Mrs. Flicker has not yet returned, but I believe the sparrows have given up the idea of taking his house. I am in doubt about Mrs. Flicker, but I know Billie. He is larger and handsomer than ever. I have studied his every beautiful feather. Sometimes I think he jumps behind a limb just to tease me, but I am fond of him and I hope he may return for many years.

ROWLAND WATTS.

BEAUTIFUL VINES TO BE FOUND IN OUR WILD WOODS.

II.

A vine of great beauty in our autumn woods, with its great masses of scarlet berries, is the *Celastrus scandens*—Climbing Bittersweet or Wax-work.

It belongs to the order Celastraceae—Staff tree family—to which family belongs the wahoo or burning-bush, with which we are all familiar, from seeing its abundant red berries in the autumn woods and in the parks.

The flowers of the *Celastrus* or Bittersweet are small, greenish and regular, growing in clusters at the end of the branchlets, the staminate and pistillate forms usually on separate plants, which accounts for the fact that we often see a beautiful vine that has bloomed profusely bearing no flowers; the flowers have five distinct spreading petals, inserted with the alternate stamens on the edge of the disk that lines the base of the calyx. Its five united sepals form a cup-shaped calyx. It has five stamens, one thick style and a three-celled ovary, with three to six seeds. It can be found in full blossom about the first of June.

The leaves of the Bittersweet are from two to three and a half inches in length, simple alternate, slightly fine-

toothed, and are found from egg shaped and oblong to the reversed of egg shaped, the apex always pointed, while the base is sometimes pointed and sometimes rounded. The fruit of the Bittersweet is about one-third of an inch in diameter, round and a deep orange color, three-celled with two seeds in each cell; when it is ripe, it opens into three parts, showing six bright scarlet berries within.

The *Celastrus* is a strong, woody climber, twining upon itself in coils and swirls, over fences and walls and bushes to great distances, often to the top of immensely high trees.

It is immensely showy and beautiful in the very late fall when its leaves are all fallen off and its woody branches are left thickly studded with its orange and scarlet fruit. I remember especially one Christmas eve, in Kentucky, that we gathered great bunches of it; we found it growing over an old stone ruin in great masses and gathering it, with large bunches of mistletoe, it made ideal decorations for our Christmas festivities.

J. O. COCHRAN.

COMPTIE.

When winter, with its blasting, icy hand, has touched every green thing exposed to its wantonness, and Thanksgiving, Christmas, New Year's and other feast days call loudly for the festive greenery with which to adorn churches, halls and dwellings, longing eyes are turned towards the Southland, where King Winter's scepter is unknown and green things flourish the year around.

A walk through the dark hummock woods—so dark that owls overhead hoot at one in the daytime—holds the naturalist and the florist spell-bound.

The numerous varieties of chirping and twittering birds, the many-hued spiders, lizards, bugs and beetles, and, yes, the wriggling snakes, with now and then the sounds of snarling 'coons or 'possums, the scream of a wild-cat, or the dashing by of the deer suddenly aroused from his noon siesta—all this makes the naturalist feel as though he had entered into an enchanted land; but he who loves "the green things growing" more than the things flying, creeping or snarling will feast his eyes on the ever varying verdure.

Tall palmettos, wide-spreading oaks, orchids, trailing vines and festooning mosses sweeping the greener mosses beneath, ferns, lilies!—but, 'twould fill a volume to enumerate the many beauties which meet the eye at even a single glance, each plant and flower in itself being worthy of a chapter.

There is one plant which especially attracts our attention and admiration; and this plant is one of the prettiest and most useful of the greeneries used for decorations in the far north in winter. It is called, variously, "Comptie," "Coontie,"

"Starch-root," or "Indian-bread." The two latter names are due to its large, bulbous root, which, when grated, makes a good starch, and which was also made, by the primitive Indians, into ash-cake, or bread—as Indians knew bread.

It is fern-like; but, unlike most ferns, it is of a sturdy, independent growth, bearing handling as well as cedar, yet with all the graceful pliancy of the more tender ferns. Its stems grow two or three feet long; the fronds on each side of the stem being three or four inches in length, and of a glossy dark green color. From one to two dozen such stems put out from a single stalk, growing up into the most graceful curves.

Seeds, deep crimson in color, and of the size of a chestnut, form in the center of the plant, and so compactly as to present one continuous bulbous form, the size and shape of a round quart bottle with part of its neck broken off. This crimson seed-form, surrounded by the dark green foliage, is, of itself, a pretty curiosity, more novel than a flower.

The reason why it is especially valued for decorations is, because it can be had at all seasons of the year, and retains its verdure for several weeks, even after it has been shipped long distances. Many of these plants, cut close to the ground, have been shipped from Florida to Canada, and have retained their fresh, glossy appearance for two months. Even without placing the stems in water, using them for motto work, they will last two or three weeks.

And this is but one of Florida's novelties in plant life.

MARY STRATNER.

THE RIVER PATH.

There's a path beside the river,
Winding through the willow copse
Where I love to walk in autumn
Ere the season's curtain drops.

On far hillsides beech and maple,
Touched by early nipping frost,
Have their brown and crimson jackets
To the boisterous breezes tossed.

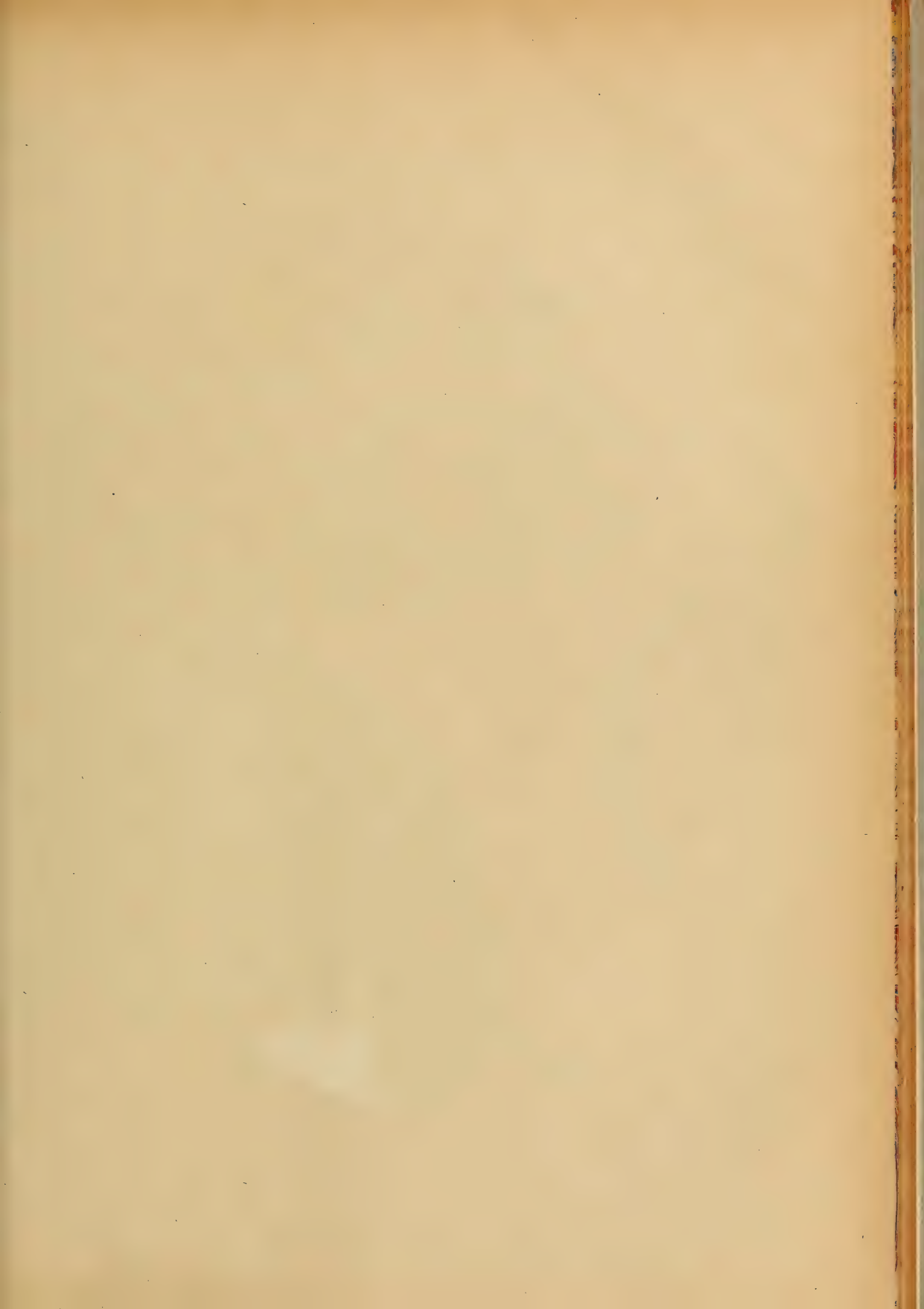
Still the willow leaves are clinging,
Latest foliage of fall,
Shading yet my river pathway
Underneath the osiers tall.

On the wimpling water's surface
Drift a million truant leaves,
Stolen from the woodland reaches
By the wind, the prince of thieves.

All along the river edges
Verdure's turned to brown and gray,
Rustling through the dying sedges
Autumn's low voiced breezes play.

Nowhere sweeter walk or rarer
Than my path beside the stream.
There I love to stroll in autumn,
There to loiter and to dream.

—FRANK FARRINGTON.





EGG PLANT.

(*Solanum esculentum* L.)

The Egg-plant, also known as bringal, aubergine, egg-apple and mad-apple, is an herbaceous plant belonging to the Nightshade family (*Solanaceæ*), therefore kin to the potato and tomato. It is a tender annual, readily killed by the early frosts. It has rather large, simple, somewhat incised leaves. The fruits are large, egg-shaped, tomato-like in structure, hence berries.

It is quite extensively cultivated in gardens. The seeds are sown in hot beds early in April but transplanting is not done until about the first of June, when all danger of frost is past. The soil should be very rich and the plants set about three feet apart. Like most transplanted plants they require shading and watering for a few days. Careful cultivation is required during the entire season. Propping may be necessary to keep the large, heavy fruits from the ground.

The Colorado beetle is a very annoying enemy of the growing plants and must be effectually fought to insure a crop.

There are several varieties of Egg-plant. The purple variety is by long odds the greatest favorite. There are also white and yellow varieties.

Most people consider the properly prepared fruit of the Egg-plant a delicacy. In some tropical countries it forms an important article of diet. The ripe fruit is prepared for the table by peeling and boiling. After boiling the fruit is sliced, seasoned and fried until well browned, in rolled crackers or bread crusts and a liberal supply of butter. When well prepared it is a very palatable article of diet but when insufficiently cooked or fried it is indigestible. It does not seem to be prepared in other ways nor does it seem to have any noteworthy medicinal properties.

ALBERT SCHNEIDER.

There comes, from yonder height,
A soft repining sound,
Where forest leaves are bright,
And fall, like flakes of light,
To the ground.

It is the autumn breeze,
That, lightly floating on,
Just skims the weedy leas,
Just stirs the glowing trees,
And is gone.

—WILLIAM CULLEN BRYANT, "The Voice of Autumn."

A MYSTERY.

I saw the wheat in billows roll,
A verdant ocean, stirred with joy,
It set a-throbbing in my soul
The madcap freedom of a boy:—
The blue sky bended far above,
A stagnant sea from pole to pole,
Clouds, like aerial ice-bergs, drove
On that still ocean, without shoal:—

The subtle spirit of the sky,
Alastor of my solitude,
Thrilled all my working pulses high.
With visions of life's magnitude—
(The wondrous vision of the whole!)
At once upon my startled eye,
Stood naked the primeval law,
Life's noiseless currents eddied by,
The universal heart I saw,
Swayed by the cosmic oversoul.—

I trembled but I did not fall,
I ceased, and yet I did not die,
But from my eyes there fell the pall,
My soul no longer wondered why:
I knew the secret of the world,
Of night and day, of life and death,
For one brief instant, onward whirled,
My being breathed with godlike breath:
The sky spun like a mighty bowl,
I saw the wheat in billows roll.

EDWARD O. JACKSON.

BIRDS AND NATURE.

ILLUSTRATED BY COLOR PHOTOGRAPHY.

VOL. XII.

DECEMBER, 1902.

No. 5

DECEMBER.

When the feud of hot and cold
Leaves the autumn woodlands bare;
When the year is getting old,
And flowers are dead, and keen the air;

When the crow has new concern,
And early sounds his raucous note;
And—where the late witch-hazels burn—
The squirrel from a chuckling throat

Tells that one larder's space is filled,
And tilts upon a towering tree;
And, valiant, quick, and keenly thrilled,
Upstarts the tiny chickadee;

When the sun's still shortening arc
Too soon night's shadows dun and gray
Brings on, and fields are drear and dark,
And summer birds have flown away,—

I feel the year's slow-beating heart,
The sky's chill prophecy I know;
And welcome the consummate art
Which weaves this spotless shroud of snow!
—JOEL BENTON, in "Songs of Nature."

THE HOODED ORIOLE.

(*Icterus cucullatus*.)

Only a very limited portion of the United States is beautified by the presence of the bright colored Hooded Oriole. The North has the richly plumaged Baltimore oriole for a short time each year, but only the far southeastern part of Texas is enlivened by this graceful, active bird of our illustration, which is "so full of song that the woods are filled with music all the day." Both of these birds seem hardly to belong to the North, where somber colors seem more in harmony with a severer climate. The Hooded Oriole does not attempt the journey and when we see the Baltimore,

"A winged flame that darts and burns,
Dazzling where'er his bright wing turns,"

in our northern woods we cannot but ask,
with the poet,

"How falls it, Oriole, thou hast come to fly
In tropic splendor through our northern sky?
At some glad moment was it Nature's choice
To dower a scrap of sunset with a voice?"

The Hooded Oriole has a very narrow range, reaching from Texas southward through eastern Mexico to Honduras, and during our northern winters it has the Baltimore as an associate. It is a social bird and frequents the home of man. One writer relating his experience with this Oriole says: "They were continually appearing about the thatched roof of our houses and the arbors adjoining for insects; they were more familiar than any of the other Orioles about the ranch."

It not only delights man by its song and beautiful coloring, but its presence is also beneficial, for it destroys countless adult insects and their larvæ.

The Hooded Oriole seldom builds its nest higher than from six to twelve feet above the ground, though in a few in-

stances it has been found as high as thirty feet. Dr. James C. Merrill, in his Notes on the Ornithology of Texas, says, "The nests of this bird found here are perfectly characteristic, and cannot be confounded with those of any allied species. They are usually found in one of the two following situations: The first and most frequent is in a bunch of hanging moss, usually at no great height from the ground; when so placed the nests are formed almost entirely by hollowing out and matting the moss, with a few filaments of a dark, hairlike moss as a lining. The second situation is in a bush growing to a height of about six feet, a nearly bare stem, throwing out two or three irregular masses of leaves at the top. These bunches of dark green leaves conceal the nest admirably. It is constructed of filaments of the hair-like mass just referred to, with a little Spanish moss, wool, or a few feathers for the lining. They are rather wide and shallow for orioles' nests, and though strong they appear thin and delicate." Not infrequently the Hooded Oriole builds its nest in plants called the Spanish bayonet or yucca. In such a situation the walls are constructed almost entirely of the fibers of the plant torn from dried leaves. These fibers are tough and the nest walls are much more durable than when made with moss. Wool or vegetable down may be used as a lining, but it is not uncommon to find no lining. The Hooded Oriole is not free from the intrusion of feathered rascals. Major Bendire says that it "is considerably imposed upon by both the red-eyed and the dwarf cowbirds, and in a few instances parasitic eggs of both species are found in the same nest."



FROM COL. CHI. ACAD. SCIENCES.

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HOODED ORIOLE.
(*Icterus cucullatus*).
 $\frac{3}{4}$ Life-size.

THE ORIOLE'S MISSION.

Sweet little bird on yonder tree,
Fly to the town with song of glee
And comfort there some lonely soul,
Thou sweetest, dearest oriole!

Perch on an open window sill,
And then pour forth thy mellowest trill.
What griefs thy carol will console,
Thou sweetest, dearest oriole!

A tale of hope to each sad heart
Thy notes of love will soon impart;
And in their memory will roll
The sweet strain of the oriole.

—CHRISTINE B. MORAY.

THE CLOTHES MOTH AND ITS METHODS.

Though it has incurred the bitter condemnation of all housewives, the clothes moth is quite an interesting little body from the naturalist's point of view. The species known in the United States bears the long name *Pellionella*. Its larva constructs a case for its occupancy. The moths themselves are very small and well fitted for making their way through minute holes and chinks. The mother insect deposits her eggs in or near such material as will be best adapted for food for the young. Further, she distributes them so that there may be a plentiful supply and enough room for each.

When one of the scattered family issues from the egg its first care is to provide itself with a home, or more correctly speaking, a dress. Having decided upon a proper site it cuts out a filament of cloth and places it on a line with its body. Another is cut and placed parallel with the first. The two are then bound together by a few threads of silk from the caterpillar's own body. The same process is repeated with other hairs until the little creature has made a fabric of some thickness. This it extends until it

is large enough to cover its whole body. It chooses the longer threads for the outside and finishes the inner side by a closely woven tapestry of silk. The dress being complete, the larva begins to feed on the material of the cloth.

When it outgrows its clothes, which happens in the course of time, it proceeds to enlarge them. With the dexterity of a tailor it slits the coat, or case, on the two opposite sides, and inserts two pieces of the requisite size. All this is managed without the least exposure of its body. Neither side being slit all at once. Concealed in its movable silk lined roll it spends the summer plying its sharp reaping hooks amid the harvest of tapestry.

In the fall it ceases to eat, fixes its habitation, and lies torpid during the winter. With the early spring it changes to a chrysalis within its case, and in about twenty days thereafter it emerges as a winged moth, which flies about in the evening until it has found a mate and is ready to lay eggs.

LOUISE JAMISON.

INCIDENTS ABOUT BIRDS.

There is much to be learned about the habits of birds, even in a casual observation of them as we meet them from time to time.

It is well known that the English sparrow is not friendly toward other birds, often driving them from their nests and even going so far as to destroy both these and their young.

Upon one occasion a sparrow took possession of the partially completed nest of a pair of martins, in process of construction, beneath the eaves of a farmhouse. When the martins returned with their load of mud for its walls, the sparrow, intrenched within, drove them away with scolding cries and fluttering wings, resisting all their attempts at dislodging him. Time after time the attack was renewed, all to no avail. There he was and there he proposed to remain.

But the plucky martins were not so easily vanquished. They retired for a season, only to renew the attack with increased vigor, waging a battle long and fierce. Finally, however, they seemed to understand that their enemy had the better of them, and bent their energies toward vengeance. Carrying mud in their beaks, they built a wall about the sparrow as he sat in possession of their home, surrounding him so completely that he was made a prisoner in the very place where he had taken forcible possession. And there they left him to his fate.

A pair of robins selected a nesting place in the fork of a maple, standing quite near a house, the chamber windows of which looked down directly into it. No sooner had they begun to carry sticks for the foundation, than a pair of crow black birds, with malicious intent, pounced upon it and scattered the sticks in every direction, taking advantage of the absence of the owners of the nest to carry out their mischief. Time after time did the robins repair the damage and begin afresh their work of construction. No sooner were they out of sight than the black birds tore the material out of the tree, seemingly working in great haste to complete their depredation be-

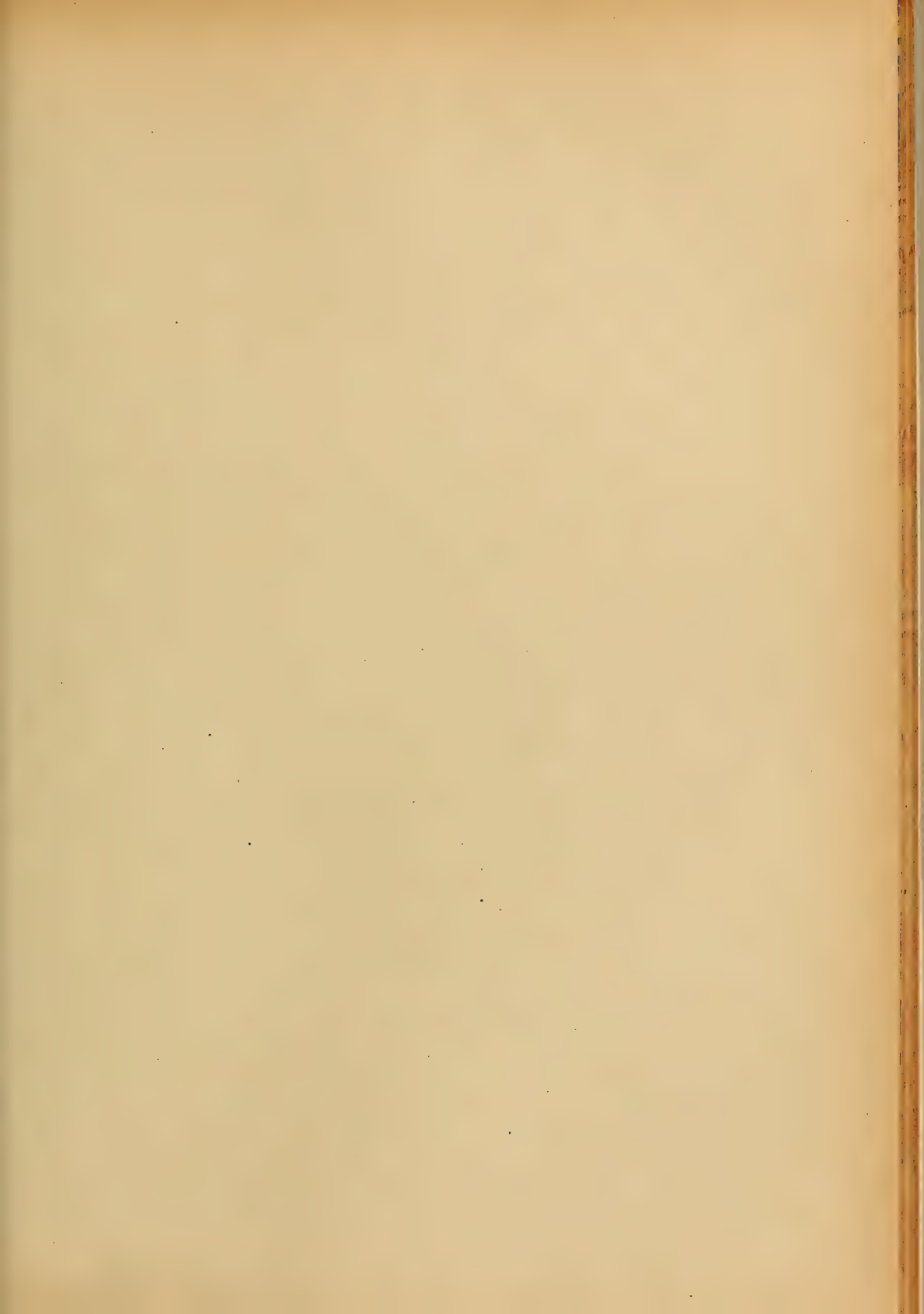
fore the robins' return.

Stormy encounters, amounting to pitched battles sometimes, ensued when the mauraunders were caught by the irate home makers in the very act of tearing to fragments the work they were toiling so painfully to complete. Not one day only, but several elapsed, and still the battle continued, the interested spectators though sympathetic were powerless to help the rightful owners of the home. The black birds seemingly did not want the nest for themselves. They merely objected to the robins building there. At last, to the great relief of the red-breasts, their enemies gave up the fight and allowed them to build the nest. This they did, laying their eggs and rearing their young without further annoyance.

Many a fat angle worm does the robin get in the spring of the year, pulling them out of the ground where the bright eyes spy them close to the surface, or partly protruding therefrom. A full-grown robin has been seen to thus capture and swallow a round dozen of earth worms inside of ten minutes.

One day a fledgling was hopping across the lawn, the mother bird alert and watchful, not far away. She had been feeding it, but evidently its hunger had not yet been appeased, for it hopped to her side and began to make the coaxing noise heard when in the nest as the parent approaches with food. The mother bird paused a moment, looked about her, then hopping to one side a short distance, she planted her feet squarely upon the ground, caught one end of a worm in her beak and commenced to pull. The worm, which was a large one, was not easily dislodged and tug as hard as she could, she could not complete her capture. Evidently the worm was too long. She fairly tipped over backward in her effort, yet without avail. All at once, and as quick as a flash, so as to give it no chance to get away, she let go her hold and seizing the worm farther down, drew it triumphantly forth and gave it to her expectant offspring.

E. E. ROCKWOOD.





THE CHUCK-WILL'S-WIDOW.

(*Antrostomus carolinensis*.)

In the wooded ravines and timbered swamps of the southern states, the Chuck-will's-widow tells of its presence by frequently calling its own name. It, with the whip-poor-will and the night hawk, belongs to the family of goatsuckers and is closely related to the swifts. The family includes about eighty-five species of these peculiar birds, nearly all being natives of the tropics, though nearly every part of the world has representatives. The range of the Chuck-will's-widow is quite limited. It includes the states from Virginia and southern Illinois southward to the Gulf of Mexico, and through Mexico into Central America. It is also found in Cuba.

Chuck-will's-widow is a bird of the twilight and night hours. Silent during the daylight hours, its penetrating voice, which is remarkably strong, may be continuously heard in the regions that it inhabits during the evening hours and for a time preceding the returning light of day. It is said that on a still evening its call may be heard for more than one mile. In its large eyes and head, its loose and somber colored plumage, its quiet flight and nocturnal habits it resembles the owls. Its short bill and the shape of the wings, permitting rapid flight, give it a close relationship to the swifts. Its mouth is peculiarly fitted for the capture of insects. The gape is enormous, and when the mouth is fully open, will measure nearly two inches from side to side. It is also aided in ensnaring insects by the long, bristle-like whiskers at the base of the mouth. It will catch and swallow the largest of the night-flying moths, and though it seems almost incredible small birds not infrequently form a part of its diet. An observer found in the stomach of one "among an indistinguishable mass of brownish matter, a small bone, about half an inch long." In another stomach he found the remains of a hummingbird only partially digested and well enough preserved for him to identify the species. Dr. F. W. Langdon states that he exam-

ined the stomach of a female Chuck-will's-widow that "contained the partially digested body, entire, of a swamp sparrow, intermingled with the feathers of which were numerous remains of insects, chiefly small beetles."

While hunting for food the Chuck-will's-widow flies low, often but a few feet above the surface of the ground. In this habit it differs from the night-hawk, which, like the swifts, seeks its food high in the air. Now and then it rests, perching on old logs or fences, from which it will launch forth in pursuit of prey which its keen eyes have sighted. During the day it roosts in hollow trees or upon a large limb in some densely shaded spot.

It does not attempt to build a nest. The two dull white eggs are laid upon the ground or upon leaves in some secluded place in woods or thickets. It is said that this bird, when disturbed at its nest, will remove either its eggs or the young, as the case may be, to a place of safety by carrying them in its mouth.

Mr. Audubon relates the following incident which came under his observation: "When the Chuck-will's-widow, either male or female (for each sits alternately), has discovered that the eggs have been touched, it ruffles its feathers and appears extremely dejected for a minute or two, after which it emits a low, murmuring cry, scarcely audible to me as I lay concealed at a distance not more than eighteen or twenty yards. At this time I had seen the other parent reach the spot, flying so low over the ground that I thought its little feet must have touched it as it skimmed along, and after a few low notes and some gesticulations, all indicative of great distress, take an egg in its large mouth, the other bird doing the same, when they would fly off together, skimming closely over the ground, until they disappeared among the branches and trees." Because of its night-flying habit, its somber colors and its peculiar penetrating notes the Chuck-will's-widow, as well as the whip-poor-will, was considered by the Indians a bird of ill omen.

AN AMATEUR CIRCUS.

A TRUE STORY.

We were not like ordinary children—in fact as I look back on our younger days it comes to me ever more strongly how very unlike we were. There was Harvey, my older brother, who never did anything that other children did and was always perpetrating some most extraordinary thing which certainly no one else ever would have thought of. However, in spite of this trait, or possibly in consequence of it, he afterwards became famous. But that is neither here nor there—we were all what the neighbors termed “unexpected,” if they were kindly disposed, otherwise it was some word to the same effect though less mild.

It was always a great blessing to us and one which we received with thankful hearts, that our father was a man of science, and his line of work made him the recipient of a varied assortment of animals which he would bring home alive and keep until he was ready to work upon them. It was only natural that we children should become fond of these creatures and beg that they might be spared the eternal sleep and left to us to play with. This was often granted.

So it happened at one time that we were the proud possessors of twenty-five different kinds of birds, animals and reptiles and the envy of all the children for blocks around.

It is so long now since the time of which I write that I may not be able to recall them all, but I give them as I remember them and by their rank—for they had rank as well as names, the highest in intelligence always going first—as they did at our funerals; for when any one of the little colony died we would give it a burial in accordance with its station in life.

First beside the grave would stand

Rex, my beautiful dog, whose knowledge was so great it seemed almost human; then would come “Daisy,” Harvey’s little Mexican pony; then “Lorita,” the parrot, whose intelligence was really remarkable; after her came “Jackie,” the monkey, and so on down. The cat, the crow, with his one white tail feather; then the smaller birds; two love-birds, a brown thrush, a blue jay and the canary. Three baby foxes followed the birds and then came the squirrels, gray, red, and flying squirrels; next to these stood the rabbits, a dozen or more of all kinds and colors: Belgian hares, pure yellows, angoras, whites and blacks, they came, a motley crew. The weasel and muskrat were next, and now the reptiles were beginning; the turtles, a hellbender and the snakes; black snakes, garter snakes, green snakes, a puffing adder and last of all came two boa constrictors.

I have reserved a special place for my own dear, stupid, little hedge hog, Billy. It used to grieve me to always see poor Billy straggling off at the end of the animals—ahead of the reptiles, to be sure—a pathetic little figure of stupidity, but Harvey insisted he deserved no better place. Possibly it was because he seemed so lonely and despised by the others, but at any rate, Billy was an especial pet of mine, and in order to disprove Harvey’s statement that, “it was impossible to teach it anything,” I spent much time and pains on Billy, and at last succeeded in teaching him to utter a little grunt when I would scratch his back and ask, “Want your supper, Billy?” But the thing that made me the proudest was when he at last could go up stairs. It was nearly three years before Billy could accomplish the entire flight, and even then it was a long and weary pilgrimage; but the patience I

had expended upon him had not been in vain. It was comical to watch his efforts—the little short forelegs trying to reach up to the next stair, where he knew a lump of sugar would be his reward.

But I am digressing. One day father and mother having gone out of town to a funeral, we children were left to ourselves. It was an opportunity not to be neglected, and our brains were at work trying to plan some new game, when Harvey arrived in our midst triumphantly waving a huge sheet of paper—a “bill-poster” he called it—upon which, in large letters, were the headlines, “Grand Circus,” and then followed an account of the animals that would take part and the tricks they would perform. Harvey assigned us our posts—he himself being ring-master, by right of his seniority and having thought of the game. Alice was the “fat lady,” while I, Paul, being the youngest, was nothing but a “feeder of animals” and tent shifter.

Under the direction of the Circus Master we assembled the menagerie in cages, or loose as the case might be, up in Mother’s bed-room. It took a good deal of time to get them all together. Polly was of a roving disposition and had to be coaxed down from the top of a tall tree, where she had perched, a square or so away; the crow was up on the roof; the rabbits and hares were scampering all over the garden—in fact, nothing but the caged animals seemed to be at hand. But the task was finally accomplished and all were ranged around the room waiting for Harvey, who had disappeared mysteriously some little time before.

Suddenly there was a most terrific clatter and noise, coming ever nearer and nearer. We looked at each other open-mouthed with surprise, when, with a flourish of lariat and a wild Indian war-whoop, that rose above the deafening noise, in dashed Harvey upon “Daisy,” a triumphant figure—having accomplished the difficult feat of making the pony carry him up stairs. He dismounted with a jump. “Ladies and Gentlemen,” he began, “the first act on the programme will be by this wonderful horse—Daisy, down on your haunches!” The lariat swept the air in

true ring-master fashion, and Daisy obediently sat back on her haunches.

“Shake hands, Daisy.”

The hoof came up—but here Rex interfered. He realized the pony had no business there and felt the responsibility which rested upon him. Good dog that he was, he started toward her, barking sharply, as though to say, “Go away—you know you have no business here.”

Then, as if his bark had been a signal, all the other animals lifted up their voices, and for a while it was pandemonium let loose—screeches from Polly, calls of “Mamma” from the crow (which it could say as plainly as any parrot, though its tongue had never been slit), grunts and squeals mingled in utter confusion. In the midst of it all who should walk in but Uncle Charles.

Now, we all knew that Uncle was not disposed to pass over lightly even the least of our offenses, and what he would say, and what was more, do now, we dared not think. But Harvey was equal to the occasion. He knew Uncle’s weak point, and went towards him nonchalantly swinging the snakes who stuck out their heads as they swayed back and forth.

Now, to us children the snakes were just as nice and pretty as any of the animals, but they were quite the opposite to Uncle Charles. The great, writhing things, swaying to and fro as they twisted in Harvey’s hands and stuck out their heads, in which the eyes dully gleamed, filled him with loathing and disgust, not unmixed with terror.

All that Uncle Charles had meant to say vanished from his mind as he saw Harvey advancing upon him with the boa-constrictors, and he began to retreat more and more rapidly, but with ever decreasing dignity. Harvey still pursued.

“Why, Uncle,” we heard him say, “what’s the matter?” There was no response—Uncle Charles had gone home. But the circus was broken up.

I think it is better to draw a veil over the consequences of our circus. No circus is complete without a side-show—and ours was no exception. We never had another one—at least not in Mother’s room.

PAUL BRENTON ELIOT.

THE GRAY-CROWNED LEUCOSTICTE.

(*Leucosticte tephrocotis.*)

The Gray-crowned Leucosticte or Gray-crowned Rosy Finch, as it is often called, is a resident of the interior of British America during the warmer months. In the winter it passes southward, frequenting the Rocky Mountain region of the United States, where it is quite common on the eastern slopes. So far as known, within the border of the United States, it only nests in the Sierra Nevada in California. While on the slopes of the mountains this Finch is usually seen in flocks. During the most severe weather it will frequent settled districts, becoming quite tame, and it has been known to seek the sheltering cover of the nests of cliff swallows under the eaves of buildings. When in the fields it is a restless bird and quite shy.

Dr. R. W. Shufeldt, while stationed at Fort Fetterman, Wyoming, had an excellent opportunity to study the habits of this handsome bird. He captured eight, including both males and females, which he placed in a cage especially prepared for them. "In a few days they not only became accustomed to their quarters, but apparently thoroughly satisfied and happy. Flocks of their companions passing over were certain to be called down, to alight on the fences, the ground, and in fact, everything in the neighborhood of the cage, to even the cage itself." The birds were given canary and flax seeds, cracked wheat and finally lettuce and other tender leaves, all of which they seemed to relish. Dr. Shufeldt also says:

"Every morning, as I approached the cage, a general and impatient chattering commenced for their breakfast and bath,

and they immediately availed themselves of both in my presence. Often I deluged the entire cage, birds and all, with a large watering pot, and they enjoyed the sprinkling immensely. Later in the spring this part of the programme was followed by their pluming themselves in the sun, chattering among themselves and the males giving utterance to a low, subdued and plaintive sort of song, being different from the shrill whistle they gave to attract the attention of their passing fellows outside." By the middle of May all the birds of this species had left the vicinity for their breeding grounds further north. Dr. Shufeldt's captives did not even pair and early in July he released them. Their plumage seemed to be at its best in the early part of May.

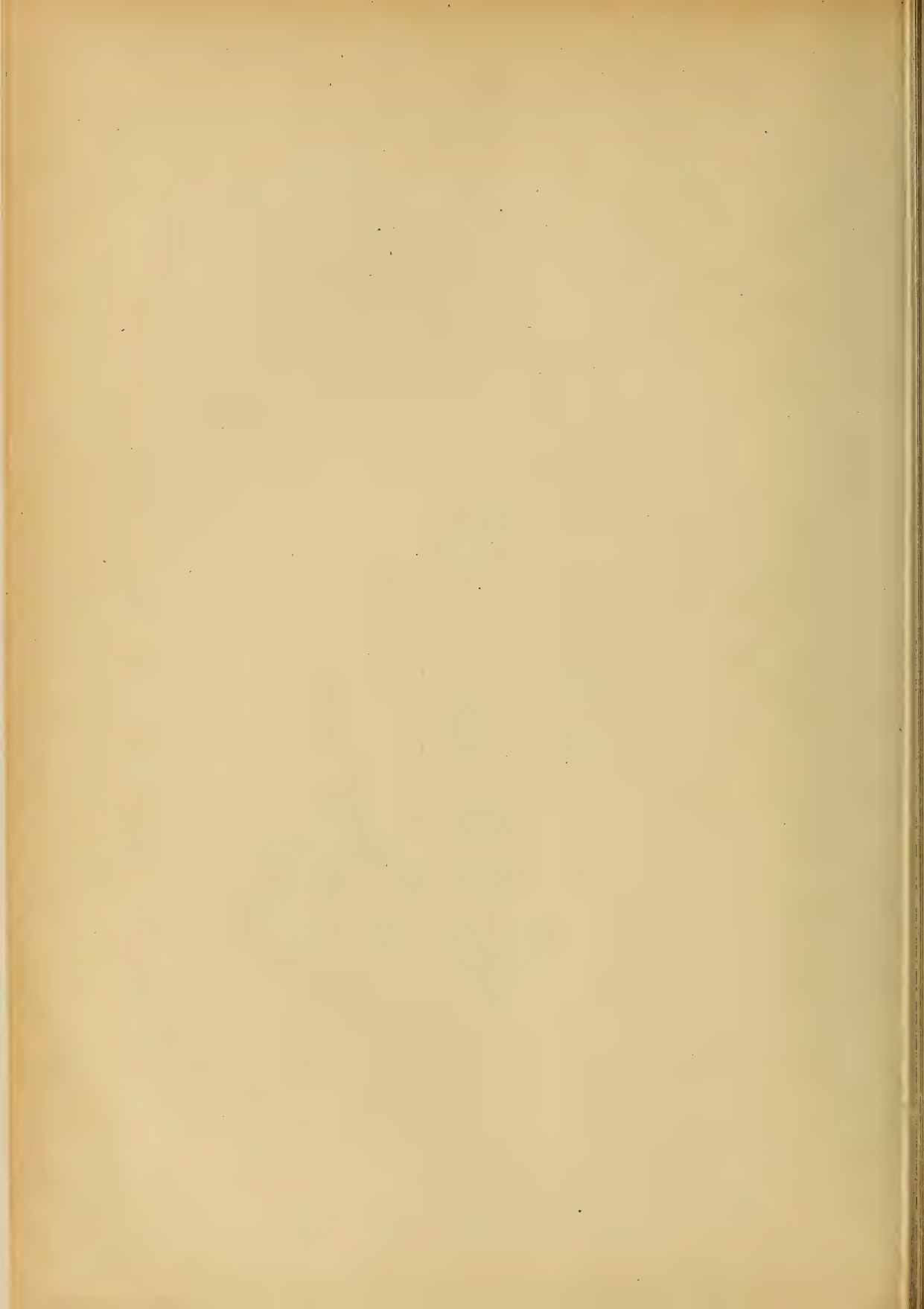
Another authority, speaking of this bird's habits in the mountain regions, says, "During summer and autumn the Gray-crowned Finch is common above timber line, where it breeds, ranging higher than the titlark and being usually found in the vicinity of snow fields and the frozen lakes near the summit of the range. It is rather shy in such localities, though exceedingly tame in winter. Its flight is in undulating lines, like the crossbills. The only note I have heard it utter is a kind of churr, like the call of the scarlet tanager. They stay above timber-line till the close of October or the middle of November. They are perpetually roving from place to place feeding upon the seeds of weeds and grasses and are never at rest for a moment at a time, constantly whirling about in close, dense masses, like so many longspurs."



AM. COL. CHI. ACAD. SCIENCES.

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GRAY-CROWNED LEUCOSTICTE.
(*Leucosticte tephrocotis*).
Life-size.



CORUNDUM AND SPINEL.

CORUNDUM.

The mineral species Corundum affords a number of gems known by different names. These differences arise from the fact that the stones were used as gems before their mineralogical identity was discovered. Thus red Corundum is known as the ruby and blue Corundum as the sapphire. When Corundum suitable for gem purposes occurs of other colors, such as green, yellow or violet, the gems are sometimes known as green, yellow or violet sapphires, respectively, or by the name of another gem which they closely resemble in color, with the adjective Oriental prefixed. Such are the gems known as Oriental topaz, Oriental emerald, Oriental aquamarine, Oriental hyacinth, Oriental amethyst and Oriental chrysolite. Colorless Corundum is known as leucosapphire. While Corundum of all colors is used for gems, it is only that which is transparent which can be so employed. This is sometimes called noble Corundum to distinguish it from common Corundum. The two, however, often occur together. Common Corundum is used as an abrasive, emery being one of its varieties, but it has no gem value.

Corundum is a sesquioxide of aluminum, with the percentages aluminum 53.2, oxygen 46.8. Its hardness is 9 in the scale of which diamond is 10, and no other mineral except the latter equals it in hardness. This hardness gives it a wearing quality as a gem second only to the diamond. The varieties of Corundum differ slightly in hardness, sapphire being the hardest. Noble Corundum has a brilliant, vitreous luster, which, while not equal to that of the diamond, is superior to that exhibited by almost any other gem. Corundum is a heavy mineral, its specific gravity being four times that of water. This high specific gravity affords an easy means of distinguishing the gems of Corundum from those of other species. Corundum is infusible and is not attacked by acids. It crystallizes in the rhombohedral division of the hexagonal system, certain crystal forms being characteristic of the two varieties,

ruby and sapphire. Thus ruby tends to crystallize in flat rhombohedral crystals, while sapphire generally forms in long, while sapphire generally forms in longer, hexagonal prisms. (See colored plate in November number.) Corundum is doubly refracting and dichroic. Of the different colors of Corundum above referred to, the blue or sapphire is most common, the red or ruby next. The other colors occur rather sparingly, green having been almost unknown until the discovery of the Montana sapphires. The nature of the coloring ingredient of the different varieties of Corundum is not known, but there is some reason for believing it to be chromium, for Fremy obtained artificial red and blue Corundum by mixing chromium with his other ingredients, after many attempts to obtain the desired color had failed.

Red Corundum varies in hue from rose to deep red. That of the latter tint is the true ruby, the color known as pigeon's blood being most highly prized. Faultless stones of this color have long been the most valuable of gems, exceeding the diamond in price, weight for weight, unless the latter is colored. Rubies above three carats in weight are about ten times more valuable than ordinary diamonds of the corresponding weights. But few rubies exceeding ten carats are known. The King of Pegu is reported to have one the size of a hen's egg, but as no one has ever seen it the story may well be doubted. In the crown of the Empress Catherine was, however, one the size of a pigeon's egg. There is also a large uncut ruby in the British crown, which Ruskin calls the loveliest precious stone of which he has any knowledge.

The chief home of the ruby is Burmah. From its mines and those of Siam and Ceylon have come practically all the world's supply of rubies. The most important Burmese mines are in Mogouk, ninety miles north of Mandalay. The rubies were evidently formed in limestone, which is now much decomposed, and seem to have been the result of metamor-

phism of the limestone by the entrance of eruptive rocks. The ruby-bearing earth is known as "byon," and the stones are obtained from it by washing. The rubies are usually in the form of more or less complete crystals. The mines have been worked since the British occupation of Burmah in 1886 by a British company, and there can be little doubt that a desire to acquire these mines was the chief reason for the occupation. The mines have not proved very profitable, however, and only within the last year or two has the company been able to pay any dividends. The hope of success has lain in the introduction of machinery for washing the byon more cheaply than it could be done by the primitive native methods, and it is now believed by the introduction of an electrical power plant that this has been accomplished. This company now produces at least one-half the annual yield of rubies of the world.

Previous to the English working of the mines the ruby mining was performed by local miners under control of the native government, all rubies above a certain size going to the king. Whenever a ruby of unusual size was found a procession of grandees, with soldiers and elephants, was sent out to meet it. One of the titles of the King of Burmah was Lord of the Rubies.

The Siamese rubies come from near Bangkok, on the Gulf of Siam. They occur in a clay which seems to be the product of alteration of a basalt. These rubies are not equal in quality to those of Burmah. Rubies are also found in the gem gravels of Ceylon and in Afghanistan, thirty-two miles east of Cabul. In our own country ruby Corundum is occasionally found in connection with opaque Corundum in Macon County, North Carolina. In the gravels of Caler Fork of Cowee Creek of this county good rubies are found in sufficient quantity to reward systematic mining for them.

These rubies are mostly small, but some gems of three or four carats' weight and of excellent color have been obtained.

Among the Montana sapphires an occasional red stone is found, but they do not have the choicest red color.

Another source of rubies is their artificial production, after the method dis-

covered by the French chemist Fremy. These are made by heating a mixture of aluminum sesquioxide, carbonate of lime, barium fluoride and potassium chromate in a porous clay crucible to a temperature of 1500 degrees C. and keeping the mixture fluid for eight days. Well-formed, clear crystals up to one-third of a carat in weight are thus produced, which have the hardness and color of native ruby. They are not considered so valuable as gems as the latter, and can be distinguished by the air bubbles which may be seen with a lens. The expense of making them is nearly equal to the value of native rubies, so that their production is likely to be limited.

Rubies were known to the ancients, being mentioned in the Bible in Proverbs and Job. The Greeks and Romans ascribed to the ruby the power of giving light in the dark, and the Hindoos describe the abodes of their gods as thus lighted. The ruby was much worn as an amulet, being supposed to protect the wearer against plague, poison and evil spirits. It was also thought that it would turn dark if its owner were in danger and would not regain its color until the peril was over.

The ruby is usually cut in the form of the brilliant, like the diamond, but sometimes the step cut is advantageously employed. The stones from India are usually rounded by the native gem cutters and worn in this manner.

Blue precious Corundum or sapphire is more abundant than the red or ruby. Like the red the blue color seems to be due to a content of chromium, since in the artificial crystals already mentioned as produced by Fremy, both colors occur at times in the same crystal. The blue color, however, unlike the reds, disappears on heating.

Blue Corundum exhibits various shades from light to dark, the color most highly prized being that known as cornflower blue. A good sapphire should also have high luster and a velvety sheen. As already noted, sapphire is somewhat harder than ruby, and it is also somewhat heavier. The Montana sapphires are said to be especially hard.

Sapphires have at the present time not over half the value of a ruby of the same

size. A price of forty dollars per carat is an average one for a stone of not over ten-carats and, as much larger stones are comparatively common, the price does not increase so rapidly as does that of the ruby with an increase in size.

The world's supply of sapphires comes chiefly from Siam. The most important mines of that country are those of Battambang, a city south-east of Bangkok. The sapphires occur in a sandy clay out of which they are washed. The sapphire-bearing region is about a hundred miles in length. Together with the sapphires occur some rubies, especially in the southern part of the district. Sapphires also occur among the rubies of Burmah, but in small numbers. The so-called gem gravels of Ceylon furnish many sapphires, though their quality is not equal to those of Siam because of paleness of color. In these gem gravels occur also ruby, spinel, garnet, topaz, amethyst, tourmaline and hyacinth. Another locality for sapphires, discovered in the early eighties, is Banskar, in Cashmere, India. These stones were first disclosed by the fall of an avalanche, and later were discovered to exist in the region in considerable numbers. For a time they could be cheaply purchased, but are now jealously guarded by the government. The Montana sapphires have been known since 1865, but were not systematically worked until 1891. They occur in river sands east of Helena, and were first obtained in washing for gold. Now the mother rock has been discovered, and this is mined, the rock being taken out, piled in heaps and submitted to the action of frost through the winter. The sapphires thus become loosened and can be readily separated. These sapphires are well crystallized and are of good average size, though few gems exceed six carats in weight. Their luster and color are for the most part of first quality, and the stones are in demand for the best of jewelry.

Noble Corundum of other colors than those of blue and red is not of abundant occurrence nor is it ordinarily as highly prized as are the sapphire and ruby. Colorless sapphire or leucosapphire is sometimes used as a substitute for the diamond, from which it can readily be distin-

guished by its lower hardness and higher specific gravity.

Certain specimens of both sapphire and ruby, but especially the former, exhibit when lighted a six-rayed star. This appears as beams of light, radiating from a center, which changes in position as the stone is turned. Such stones are called star or asteriated sapphires or rubies, and are highly prized. They are usually cut with rounded surface, as this best brings out the figure. The cause of the star-shaped figure is generally supposed to be the presence of countless microscopic cavities in the stone, which are arranged parallel to the faces of a six-sided prism. The total reflection of the light from these causes the star. Others think that multitudes of twining lamellæ cause the appearance.

Sapphire is a word which is the same in nearly all languages. In Chaldean, Hebrew, Greek and Latin it has the same form as in modern tongues. This fact testifies to the ancient use of the stone. In early times sapphire was believed to be a destroyer of poison, so that if put into a glass with a spider or venomous reptile it would kill it. It was regarded also as a remedy against fevers.

SPINEL.

The group of Spinel includes in mineralogy a number of species of different though analogous composition. The Spinel employed as a gem is almost wholly confined to the magnesium aluminate, having the percentage composition alumina 71.8 and magnesia 28.2. This is usually of a red color, different shades giving gems known by different names as follows: Deep red, spinel-ruby; rose-red, Balas ruby; yellow or orange-red- rubicelle; violet red, almandine ruby. Spinel is thus known among gems chiefly as a relative of the ruby, and this sort of Spinel will first be considered.

The Spinel rubies differ from the true or corundum rubies in hardness, specific gravity and system of crystallization. The hardness of Spinel is 8, or about that of topaz, and the specific gravity 3.6. It is thus neither as hard nor as heavy as corundum ruby. Again, the system of crystallization differs. Spinel crystallizes in the isometric system and is usually found in the form of octa-

hedrons, while corundum ruby is hexagonal in crystallization. (See colored plate in November number.) Spinel is singly refracting, in polarized light and corundum doubly refracting. Spinel ruby is infusible before the blowpipe, but on heating undergoes a curious series of changes in color which are quite characteristic. The red changes first to brown, and then becomes black and opaque, but on cooling the black changes to green, then becomes nearly colorless and finally the stone resumes its original red color. As a small percentage of chromium is usually found by analysis to exist in ruby Spinel, its color is generally considered to be due to this ingredient. While the Spinel ruby is considered of less value than the corundum ruby and is sometimes by fraud or error substituted for the latter, it yet has a definite value as a gem and is sold under the name of Spinel ruby or some of its varieties. This value is usually reckoned at about half that of the corundum ruby, although variations in quality of the stones, as well as changes in demand, cause differences of price. Thus Emanuel mentions a Spinel ruby of good quality weighing 40 carats, which in 1856 was sold for two thousand dollars, but which in 1862 brought at public auction only four hundred dollars. In 1866, however, it was again sold for twelve hundred dollars. The Spinel ruby of the French crown jewels, weighing 56 carats, was in 1791 valued at ten thousand dollars.

Not only is Spinel ruby related to corundum ruby in color and use, but the two are frequently associated together in nature. The gem gravels of Ceylon, Siam, Australia and Brazil contain both kinds of rubies, and the ruby mines of Upper Burmah, where the corundum ruby occurs in a crystalline limestone, produce also large quantities of Spinel rubies. Spinel rubies also come in large quantity from Badakschan, in Afghanistan, near the river Oxus, the name of Balas rubies, by which they are often known, being said to be derived from Beloochistan, or Balakschan. The Persians have a tradition regarding these mines

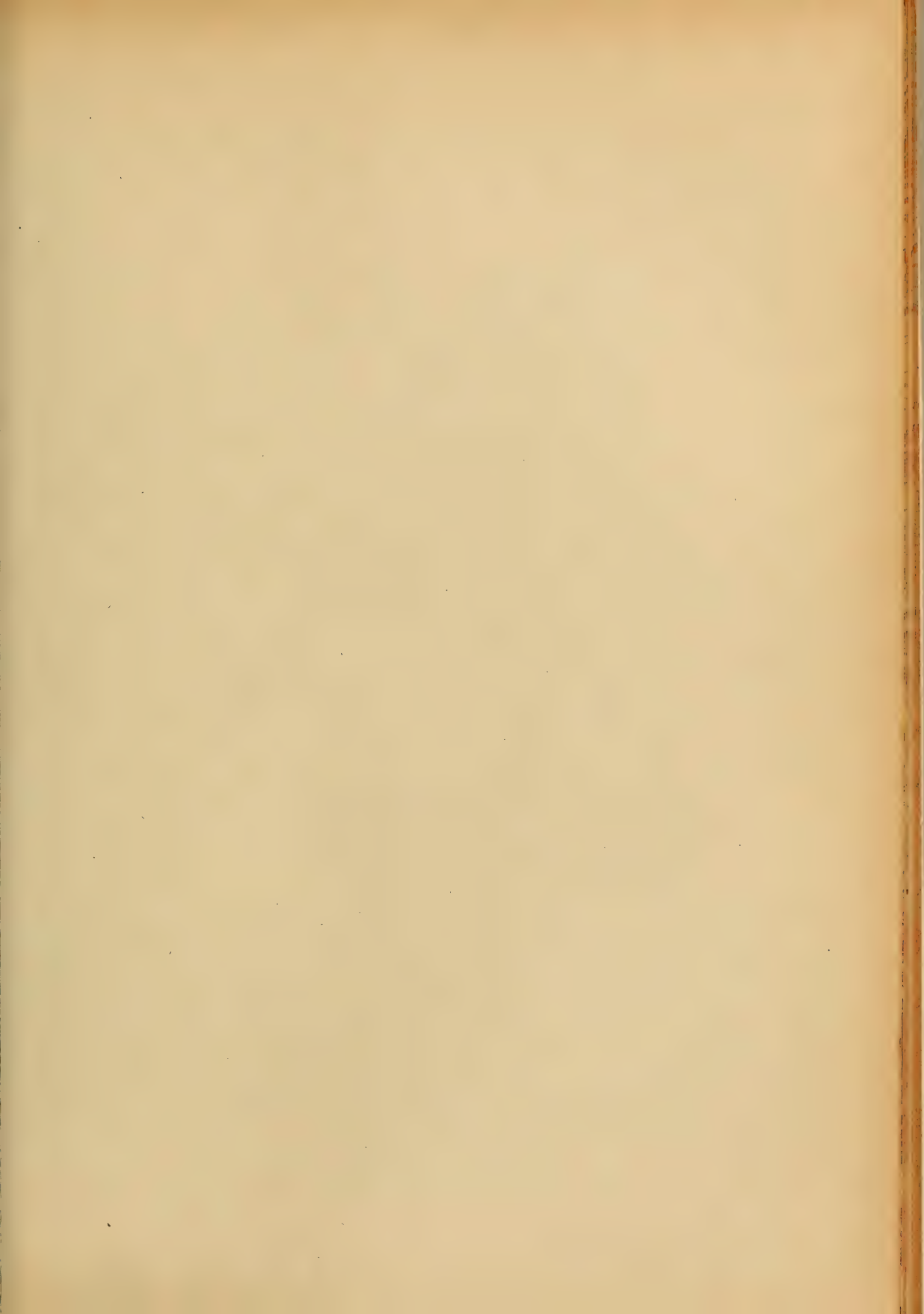
that they were disclosed by an earthquake which rent the mountain in twain. The localities above mentioned furnish nearly all the Spinel rubies of commerce. A few have been found in North America at Hamburg, New Jersey, and San Luis Obispo, California. But these localities have never afforded any appreciable supply. No Spinel rubies of great size are known. Bauer mentions as the largest known, two cut stones, one of 81 carats and the other 72½ carats, exhibited at the London Exposition of 1862. The King of Oude is said at one time to have possessed a Spinel ruby the size of a pigeon's egg.

Spinel occurs in many other colors besides red, such as orange, green, blue and indigo, as well as white and black. Occasionally colorless Spinel occurs, and as they cannot be distinguished by their behavior in polarized light from the diamond, it is sometimes sought to substitute them for the latter. They can be detected at once, however, by their inferior hardness. While Spinel of any color, if transparent and free from flaws, make desirable gems, the only colors found in sufficient quantity outside of the red to make an appreciable supply are the blue and the black. The blue Spinel resemble the sapphire in color, though they are somewhat paler. They come chiefly from Ceylon and Burmah, where they occur together with the ruby Spinel. The black Spinel is known as Ceylonite, or pleonaste, and is also obtained chiefly from Ceylon, although occurring of quality suitable for cutting at Mount Vesuvius in Italy.

Like the ruby, Spinel can be made artificially, the process being to heat a mixture of alumina and magnesia with boracic acid, and if the red color is desired, a little chromium oxide.

The Spinel ruby seems to have been known to the ancients equally with the corundum ruby, and the two were probably often confounded. The natives of India call the Spinel the pomegranate ruby and believe to this day that it possesses valuable medicinal properties.

OLIVER CUMMINGS FARRINGTON.





FROM COL. CHI. ACAD. SCIENCES.

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WHITE-CROWNED SPARROW.
(*Zonotrichia leucophrys*).
Life-size.

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THE WHITE-CROWNED SPARROW.

(*Zonotrichia leucophrys*.)

With the snowflakes o'er the mountains
Hasten past the hawks from Northland,
Speed along the titmice, juncos,
White-crowned Sparrows, wrens, and creepers,
Tiny kinglets, sweet-voiced bluebirds,
All in eager search for havens
Where the touch of winter kills not.

—Frank Bolles, "Birds in October."

Mr. Ernest E. Thompson calls the White-crowned Sparrow an aristocrat of the sparrow family. One of the largest of the sparrows, its beautifully marked plumage and its dignified mien, as it stands on some exposed perch, immediately attracts the attention of an observer. Its range is extensive, covering the whole of the United States during its migrations, and in winter it passes further southward into the valley regions of Mexico. In the selection of a nesting site a pure and cool atmosphere seems a paramount consideration. The mountain regions of the western United States and the country lying north of the great lakes and eastward into Labrador seem to meet the requirements for the home building of these sweet dispositioned birds. Then its music is sweetest. During its migration, however, localities not favored with its home are often regaled "with selections of its melodies as it rests in thickets and hedgerows while slowly passing through our country on its northward pilgrimage." From some high bush or other favorable perch the male will pour forth an almost unbroken song while its mate is setting. Often this song does not cease with the going down of the sun, and it has been heard as late as midnight. It is a "lively, agreeable song, fine and clear, and is frequently heard from a score or more of birds at the same time with a most pleasing effect."

Its song, quite closely resembling that of its relative the white-throated sparrow, with which it quite frequently consorts during its migrations, yet the two songs are readily distinguishable. Mr. Thompson compares the songs. He says: "Its usual song is like the latter half of

the white-throat's familiar refrain, repeated a number of times with a peculiar, sad cadence and a clear, soft whistle that is characteristic of the group." Dr. Coues, speaking of the two songs, says that the song of the White-crowned Sparrow is "a less enterprising vocal effort, of only five or six syllables, like pee, dee, de, de, de, the two first long drawn, rising, the rest hurried and lowering." Transcribed into words, there are almost as many renderings of the White-crowned's song as there are observers. Mr. Burroughs says that the song "begins with the words fe-u, fe-u, fe-u, and runs off into trills and quavers like the song sparrow's, only much more touching." To Mr. Langille "the song is quite peculiar, whee-who-who-zee-zee-zee, the first three notes in a clear whistle and the last three in a sort of jew's-harp tone, the whole being decidedly pleasing, and not at all like that of the white-throat."

The food of the White-crowned sparrow consists of both insects and seeds. To some extent they feed upon berries, and Audubon states that in Labrador they also eat minute shellfish, "for which they frequently search the margins of ponds or the seashore." This bird is a scratcher. It is also a hopper and hence scratches with both feet at once.

The nest of this Sparrow is usually constructed of grass or moss and is placed either on the ground or in low bushes. Audubon describes a beautiful nest of this species which he found in Labrador. This nest "was placed in the moss, near the foot of a low fir, and was formed externally of beautiful dry green moss, matted in bunches, like the coarse hair of some quadruped; internally of very fine, dry grass, arranged with great

neatness, to the thickness of nearly half an inch, with a full lining of delicate fibrous roots of a rich transparent color."

Of this beautiful Sparrow Mr. Burroughs has said: "Among the birds that tarry briefly with us in the spring on their way to Canada and beyond, there is none that I behold with so much pleasure as the White-crowned Sparrow. I have an eye out for him all through April and the first week in May. He is the rarest and most beautiful of the sparrow kind. He is crowned as some hero or victor

in the games. His sparrow color, of ashen gray and brown, is very clear and bright, and his form graceful. His whole expression, however, culminates in a regular manner in his crown. The various tints of the bird are brought to a focus here and intensified, the lighter ones becoming white and the deeper ones mainly black. There is the suggestion of a crest also, from a habit this bird has of slightly elevating this part of its plumage, as if to make more conspicuous its pretty markings."

AFTER THE SNOW STORM.

Chick-a-dee-dee, chick-a-dee-dee,
Tell me where were you
When last night the white snow drifted
And the north wind blew?
Chick-a-dee-dee, chick-a-dee-dee,
Bonny little bird!
Come anear my window, let me
Whisper you a word:

If you'll stay with me all winter,
Chick-a-dee-dee-dee,
Apple-cores and crumbs I'll give you;
Best of friends we'll be;
You shall sit among the branches
Of the lilac tree,
Sit and sing anear my window,
Chick-a-dee-dee-dee.

Glad indeed I'll be to see you;
Promise me you'll stay,
Food and shelter I shall find you
For the winter day;
And in spring I'll give you, dearest
Chick-a-dee-dee-dee,
For your nesting-place and bower,
All my lilac tree!

—Mary Grant O'Sheridan, in the Chicago Tribune.

THE FEATHERED FISHERMAN.

The cormorant is a strange and remarkable bird, and is found in many parts of the world. It is of large size and somewhat resembles the goose and the pelican. Its feet are webbed, and its middle toe has notches like the teeth of a saw, which help it to hold its prey. Its plumage is generally dark, while the feathers on its head and neck are jet black. Its bill is long and straight, except at the end, where the upper part bends into a sharp hook.

The cormorant is a great fisher, and it is needless to say that it is only found where fish are to be had, as it lives chiefly upon them. It is a very greedy bird, and will hover over the water for hours at a time, catching and devouring fish until it can swallow no more. Sometimes the cormorant will play with its prey, letting it go and diving after it several times, but its victim never escapes in the end. This bird has seldom been known to miss its aim when diving for a fish. It drops from a great height when descending upon its prey, and sometimes it is seen to emerge from the water holding a fish by the tail, in which case it cannot very well manage to swallow it, so the fish is tossed up into the air and, turning a complete somersault, comes down head foremost into the bird's mouth. The home of the cormorant is among the steep ledges of rock by the sea, where they build their nests and rear their young. Their nests are made of dry sticks, weeds and moss. The old birds return each year to their old nests,

repair them and begin rearing another brood. At night those having no broods roost apart, standing erect in files upon the top of some high ledge. The young birds are of a livid color and present a very unattractive appearance. Their legs and feet are enormous and all out of proportion to their little bodies.

When leaving for the season cormorants fly in long lines one after another. In their wild state it is almost impossible to get very near the cormorants when they are fishing, as they are very cautious and have many sentinels to warn them of the approach of danger.

In far-off China the cormorant is tamed and put to a very curious and practical use. When a Chinaman goes fishing he does not take a rod and line, as we do, but sets out in his boat and takes some trained cormorants along with him. As soon as he comes to a place where there are plenty of fish, the cormorants plunge into the water, catching fish after fish, and, at their master's call, dropping them in the bottom of the boat. These birds are so greedy that if left to themselves they would eat the fish as fast as they caught them, so the cunning Chinaman ties a small piece of twine around their necks so that they cannot swallow it. In this way he gets a boatload of fish with very little trouble. After the cormorants have finished their work, the strings are untied and they are allowed to fish for themselves.

WALTER CUMMINGS BUTTERWORTH.

A WINTER-PIECE AMONG THE PENTLANDS.

A flock of fieldfares from the leafless trees
Flew chattering mournfully, while here and there
A single redwing flung upon the breeze
A sigh that seem'd the utterance of despair.

But on the burn, scarce half a mile below,
The bluff white-breasted ouzel from a rock
Pour'd his bold song—a huddling overflow
Of mirth, those faint-heart winter-fowl to mock.

—HENRY JOHNSTONE.

THE CARNATION.

Most of the names by which we are accustomed to designate familiar forms of the vegetable kingdom have descended to us from remote times and from ancient associations. The old terms are for the most part founded either on the medicinal values of the plants or on some mythological fancy that accounted for their creation or form.

The Carnation derived its generic name from the latter source. The term *Dianthus* is derived from two Greek words, signifying flower of Jupiter, while the specific name, *carophyllus*, is obtained from words meaning nut and leaf, originally applied to the clove tree, but later given to the Carnation, because of its spicy fragrance. Again, the word Carnation is from the Latin, meaning flesh, and was deemed appropriate because of the pink and white color of the petals.

The name *Dianthus*, or flower of Jupiter, originates in a Greek myth, that had to do with the establishment of Olympus. Jupiter had escaped the unpleasant fate that befell his brothers, namely, of being swallowed by their unnatural parent, Saturn. Jupiter married Metis (Prudence), who straightway demonstrated the fitness of her name by bestowing on Saturn a draught which caused him to disgorge his domestic bill of fare, and the sons, banding together, imprisoned their father and his brother Titans and divided their empire among themselves. Jupiter inherited the heavens and became king of gods and men. When the Thunderer came into possession of his kingdom Vulcan, the celestial artist, crowned him with a chaplet of beautiful flowers, whose white petals Iris had marked with the colors of the rainbow, their edges being bright with the plumage of the peacock, which was the favorite bird of Juno, as was Iris, her chosen attendant, after she espoused Jupiter and became queen of the gods. Hence the *Dianthus* became the flower of Jupiter.

The Carnation has been under cultivation for more than two thousand years. Theophrastus, who gave the plant its technical name, states that "the Greeks cultivated roses, gillie flowers, violets, narcissi and iris," gillie flower being the old English name for the Carnation, having been bestowed upon it for the reason that it bloomed in July. It was also called the *Coronarium* because it was the coronation flower of a queen of Italy during whose reign in the sixteenth century the plants were introduced into England.

From their first appearance in England Carnations took a firm hold on the popular fancy, varieties began to be formed, the original flesh color being broken up into red and white. The remarkable susceptibility of the plants to cultivation, their beauty and fragrance, so appealed to the florists of Italy, France, Germany and Holland that in 1597 Gerard wrote that "to describe each new variety of Carnation were to roll Sisyphus' stone or number the sands."

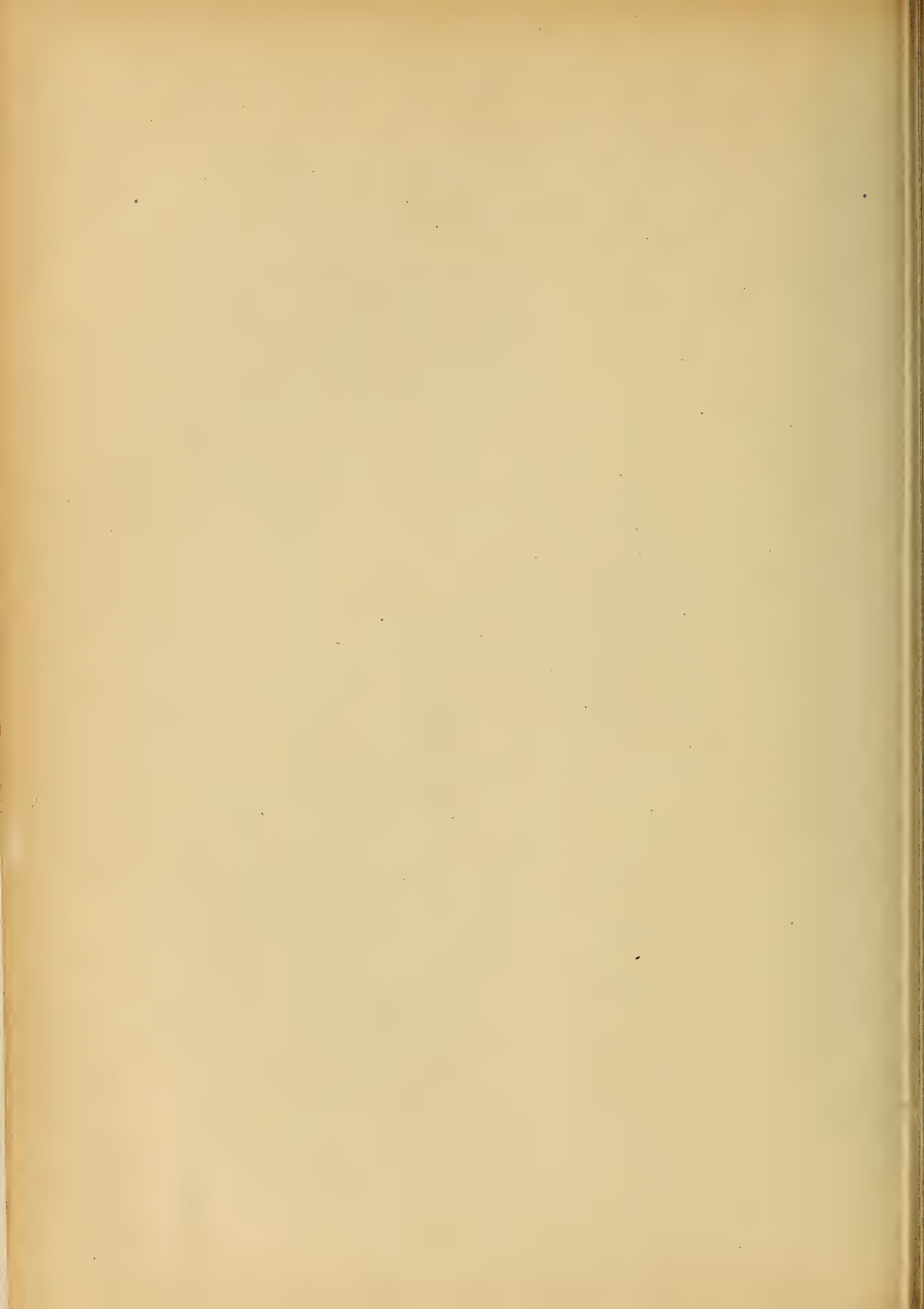
The Carnations of to-day originated about 1840, as a distinct race. Special attention was given in Europe to the elaboration of the plants by M. Dalmais and M. Schmitt, and the varieties created by them were imported to America in 1868. Bench cultivation was started in the United States in 1875 and became so popular that in 1892 the specialist or "Carnationalist" first became known. At that time there were about five hundred distinct varieties, all of American origin.

The Carnation is a native of Central and Southern Europe. Since its introduction into England it is said to have escaped cultivation and to have become fixed in several localities. In its cultivation three general classes have been established by English specialists. The selfs are plants whose flowers have a uniform color. The flakes possess a pure ground of white or yellow, flaked or



CARNATIONS.
(*Dianthus caryophyllus*).

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striped with one color, the stripes running longitudinally through the petals. The bizarres are such as have a pure ground, marked as in the flakes, but with two or three colors; this form possesses the most fragrance, especially when there is a frequent recurrence of the stripes. Lastly there are the picotees, having a pure ground, each petal being bordered with a band of color. This last form includes many of the rarest varieties and the yellow picotee is famous in several royal establishments.

It is a peculiar fact that rain will injure the colors of the more delicate varieties, and the florist must shield the opening flowers from direct sunlight if he would obtain the best results.

In the perfect flower the pod and calyx should be long, the flower circular, not

less than three inches in diameter, rising gradually towards the center, so as to form a sort of crown. The outer petals should be large and few in number, rising slightly above the calyx and spreading horizontally, the other petals being regularly disposed above them, nearly flat, diminishing in size towards the center. The ground should be a pure color and the petals wax-like.

The Carnation is allied to the pink family, and consequently is related to the modest Indian pink, the Chinese pink and the Sweet William. These lowly forms doubtless nourish a secret pride in their relationship to the illustrious head of the house, concerning which Shakespeare said, "The fairest flowers of the season are our Carnations."

CHARLES S. RADDIN.

WINTER SONG.

Sing ho! for the hilltop bold and bare,
Where the bracing breezes blow!
There's a frosty edge on the wintry air,
Exhilaration keen and rare
That sets the heart aglow.

Over the crest the snow lies deep,
Over the brow of the hill.
Down below the woodlands sleep,
Blanketed well on the sloping steep
'Neath a snow sheet white and chill.

Sing ho, sing ho, for the galloping gale
That sweeps the summit clear,
And drives the mass of icy shale
Into the pines, whose eery wail
Fills timid souls with fear!

There's that in the winter's whistling wind
That stirs dead hearts to life,
And energy and health you'll find
In the breath of the breeze that's rough yet kind,
That's keen as a surgeon's knife.

—FRANK FARRINGTON.

BUDS OF PROMISE.

COLD WEATHER NOTES FROM NATURE.

It has become a conventional habit with us to look upon the winter season as unproductive of artistic interest so far as Nature's decorations are concerned. And we note it as a period of rest from the exhaustion of seed time and harvest. But to the initiated and observant, it is now that the change worketh fast, and barely has the network of fretted branches, looming up so purple against an autumnal sky, become a realization, before the winter progress of the budding forest has changed the dreamy violet to a rich ruddy brown, in promise of a future fulfillment of a rich verdure of living greens.

In winter, we are, as it were, behind the scenes in the green-room of some vast forest auditorium, and the closely locked buds are become the dressing rooms of thousands upon thousands of gaily decked flower-folk, who are preparing their multi-colored wardrobe of gorgeous petals, with which to entrance and delight our mortal eyes when the golden key of the sun shall have unlocked their doors, and are melted the barriers of ice and snow that now reign supreme in the great foyers of the forest. But if at present we are barred from the scene, the work of preparation is being rushed forward, and on every swelling twig there is evidence of a glorious drama of delight which shall be uncurtained at the clarion voice of Spring. How many shades and colors are outlined against the wintry sky! The bronze points of the oaks, in contrast with the gray of the pale ash buds, whose color indicates the advent of some demure debutant in Quaker costume, while the ruddy buds of the whitewood or tulip tree, which steal their rich color from the furrowed red of its bark, give promise of some gorgeous result that is later realized in the magnolia-like bloom of rich, creamy green, girdled with a crimson sash, and which within the last few years has become such a fad among nature's devotees. But all of our fads are but a continuing in the universal circle

from which, according to Lord Beaconsfield, we never evolve beyond, and it is written that the tulip tree was so esteemed by the ancients that they poured libations of wine about its roots. We put our wine to other uses in these twentieth century days, but we worship at the same tree, *pro tempore*.

The highly polished buds of the June berry or shad bush shine forth in evidence of a future of bewildering bloom that shall envelop its now dull branches in a robe of fairy whiteness when "the shad come down." Break open the tightly sealed, varnished bud of the lilac tree, and out pours that incomparable fragrance of Spring, an odor that challenges all of the arts and sciences or alchemy to produce. One of the most notable trees in winter is the plane-tree or buttonwood, wrongly called sycamore, a term which can only be applied correctly to the *Ficus sycamorus*, or true sycamore, a tree closely allied to the fig, and a native of the far East. It is the ragged appearance of the buttonwood that makes it so conspicuous a tree in winter, the white trunk gleaming so distinctly through its shattered habiliments of bark. It is said that this disastrous state of its covering is due to the inelasticity of the bark, which does not expand to meet the requirements of the tree's growth, as does the bark of other trees, hence the impoverished condition of its outer garment. But when we see this sad state of conditions repeated on its human prototype, we feel that we have more cause for sympathy than ridicule, so why not accord the tree the same commiseration? But I am sure there is some legendary tale extant to the effect that in mythological days the tree was a dervish from duty in some line or another, and for this was condemned to pass the rest of its days in a tattered coat, for so was sentenced the white Birch, who arrived late at an important wedding of the gods, hence doomed to wear her wedding garment of snowy bark throughout all ages in penance for her dilatori-

ness. But if the buttonwood wears the coat of poverty, it is more than abundantly supplied with buttons, which are so tightly sewed on that it is no easy task to secure a bunch of these drooping balls for decorative purposes, and for which they are so effective when hung among clusters of the scarlet berries of the bitter-sweet. Their secure hold on the parent stem has thus aroused the interest of John Burroughs:

"Why has Nature taken such particular pains to keep these balls hanging to the parent tree intact till spring? What secret of hers has she buttoned in so securely? for these buttons will not come off. The wind can not twist them off, nor warm nor wet hasten or retard them. The stem, or penduncle, by which the ball is held in the fall and winter, breaks up into a dozen or more threads or strands, that are stronger than those of hemp. When twisted tightly they make a little cord that I find it impossible to break with my hands. Had they been longer the Indian would surely have used them to make his bow strings and all other strings he required. One could hang himself with a small cord of them. Nature has determined that these buttons should stay on. In order that the needs of this tree may germinate, it is probably necessary that they be kept dry during the winter, and reach the ground after the season of warmth and moisture is fully established. In May, just as the leaves and the new balls are emerging, at the touch of a warm, moist south wind, these spherical packages suddenly go to pieces—explode, in fact, like tiny bombshells that were fused to carry to this point—and scatter their seeds to the four winds. They yield at the same time a fine pollen-like dust that one would suspect played some part in fertilizing the new balls, did not botany teach him otherwise. At any rate, it is the only deciduous tree I know of that does not let go the old seed till the new is well on the way."

Next to the cedar tree, this tree is the strongest power in mythology and was, by the ancients, consecrated to Genius, and who knows what mighty stores of intelligence is buttoned under its tattered coat? and I myself can bear witness to its strong will and determination under

adverse circumstances, for a huge tree that has fallen from a high bank into the river below, has floated down stream to a lodgment, and there put forth a vigorous growth of foliage, and is thriving well under these abnormal conditions. The maple bloom is now closely housed, with but little show of promise, but if one were favored with a specially alert ear, I am sure that he could hear the rush of the ascending sap blood, hurrying upward in answer to the call of the quickening Spirit of Spring. In many of the creepers, the lilies and the gourd, a kind of fever heat is perceptible at the time of inflorescence, and the heat has been observed to increase daily from sixty to one hundred and ten or even one hundred and twenty degrees, and without doubt the forest temperament rises accordingly.

As yet the birds have not taken all of the scarlet berries of the bitter-sweet vine, which clings lovingly, but with a somewhat parasitical clasp about the hospitable boles of the great trees. In color rivalry looms up the dark red panicles of the sumach, whose acrid fruit, which is a last resort for hungry birds, must prove a pungent pill to the feathered folk. But it is a line of beauty across the hillside:

Like glowing lava streams the sumach crawls
Upon the mountain's granite walls.

Peeping out from the sheltered cranies are numerous long, slender fronds of the Christmas fern, *Polystichum acrostichoides*, gleaming like emerald bars against the white of the snow bank. Outlining against the sky are the aristocratic hemlocks which belong to the regal pine family, and which have established a social precedence by wearing their holiday clothes all the year round, in opposition to their more humble, deciduous kin, who are now in working habiliments, and they flaunt their heads haughtily, but their thickly clothed branches form a warm shelter for snow bound birds, so that their distinction is not without its advantages. In a sheltered nook still flourish a few plants of "Life Everlasting," so dear to the hearts of Mary Wilkin's quaint New England characters as an allayer of rheumatic ills, and it still exhales its aromatic fragrance in the air. Here and there a witch-hazel waves its scraggy branches, still laden with

their velvety seed capsules, which have but now bursted open and shot forth their glistening seeds, and whose inconsequent yellow bloom has only just shed its slender petals to the winds. A few lingering wild rose haws are withering upon the parent stem, yet glowing like cherries against the wintry sky, but break off a tiny branch and a whiff of Richard Jefferies' "sweet briar wind" is wafted across one's nostrils, filling one's brain with visions of the gladdening spring

time. A gaily plumaged jay dashes his brilliant blue through the branches of a thickly needled pine, and a scarlet crowned "downie" taps diligently up and around the worm-infested trunk of an old apple tree, in search of an unwary morsel, and one comes to the conclusion that after all, winter is not all gloom and grayness, but filled with bits of glowing color and vitality, if only one's eye is set for its beauty, instead of its bleakness.

ALBERTA FIELD.

HOW A CAT SAVED THE LIFE OF A CANARY.

In a small town in Minnesota, noted for its several state institutions of learning, lives a widow whose success in the training of a cat has made her quite noted in her locality.

Tiger, the cat, is not famous for his long hair nor for his long pedigree. He is simply a creature who has been loved and petted into a wonderful amount of sympathy for his mistress and he seems to know instinctively many of her likes and dislikes, and he would no more harm Dick, the canary, who lives in the same room, than he would attack the hand which places the saucer of milk before him each day.

One morning, Mrs. Rogers (as we will call his mistress, though that is not her true name), allowed Dick to take his bath in his tiny tub upon the dining-room floor, while she rearranged and dusted the furniture of the room, leaving the door wide open during the time. A neighbor sat by the doorway watching Dick bathe and, not having the faith in Tiger which his mistress held, exclaimed, "That cat of yours will kill your bird sometime. I know he will."

Mrs. Rogers smiled very quietly as she stopped to give Tiger an assuring

pat on the head and a word of praise for his goor behavior, for she believed he understood the neighbor's unkind remark.

"Tiger is a good cat and I'll trust him any time with Dick," said his mistress, turning away from him to attend to her duties.

A prolonged "Oh!" like a stifled scream came from the neighbor's lips the next minute for Tiger had sprung at Dick and held him tightly in his cruel jaws.

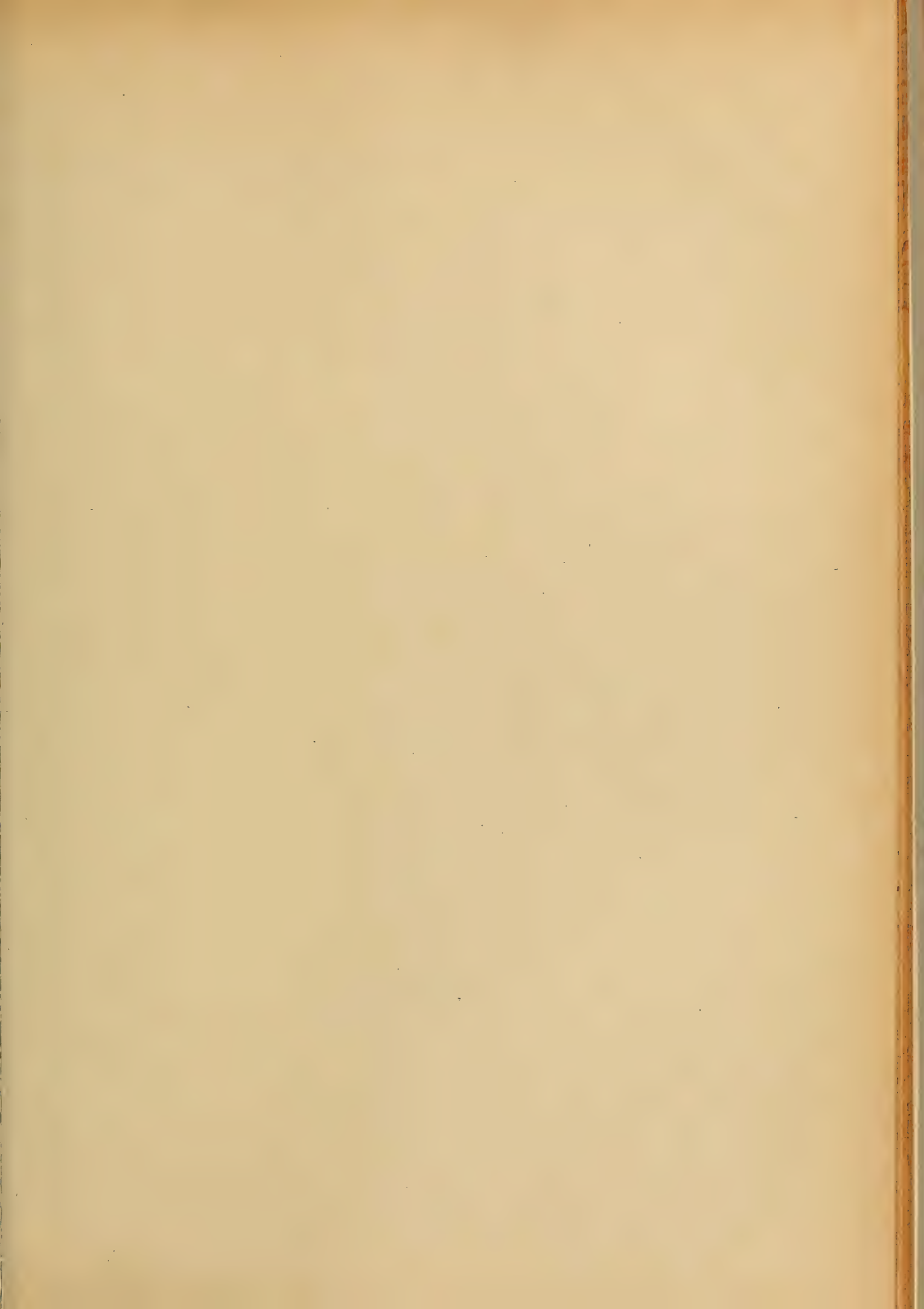
"See Tige! See Tige!" exclaimed the visitor.

But Dick never fluttered a bit and Mrs. Rogers patted Tiger again as she caught sight of a vanishing stranger cat disappearing through an open window.

"Brave old Tiger! Good little Dickie!" said their mistress, as she took the bird, unharmed, from Tiger's teeth, which had held the bird safely away from real danger.

Dick flew back to his open cage, Tiger went back to his nap in the sunshine, and the lady visitor learned the lesson that love works wonders in even the creatures that do not speak as we do.

MARY CATHERINE JUDD.





FROM COL. CH. ACAD. SCIENCES.

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POCKET OR KANGAROO RAT.

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THE POCKET RATS.

Rats and mice seem to enjoy living in localities that are frequented by but few other animals. They are also adepts at seeking food supplies and travel long distances when hunger demands and a supply of food is not at hand. The Pocket Rats are no exception to this rule and some of the species live in dry, arid regions where but little vegetation grows, aside from a few species of cactus. The rat of our illustration was found by Mr. Frank M. Woodruff in such a locality, where it had hidden under the sheltering branches of a cactus.

The marked characteristic that gives these little animals their name is the pockets or cheek pouches. These are external openings outside of the mouth and are lined with a furry skin. They are ample in size and the two will hold, in some instances, a heaping tablespoonful of grain. "The filling is done so rapidly that, where a hard grain like wheat is used, a continuous rattling sound is made. The ejecting of the grain from the pockets is aided by a forward, squeezing motion of the fore feet, each foot making two or three quick forward passes. Some of the species seem to thrive in captivity, and after a few days do not fill their pouches, apparently having learned that it is a useless labor. When obtainable, their natural food consists of various plant seeds, but when in the neighborhood of cultivated fields and the vicinity of houses, they feed also upon grain and the vegetable waste from camps and houses. Mr. F. Stephens says that some of the species, whose habits he has studied, will eat about a heaping tablespoonful each of wheat or barley in twenty-four hours and one or two square inches of beet or cabbage leaves." As they are often found in regions practically devoid of water, a large part of the year, it is highly probable that they obtain the necessary moisture from succulent leaves. In captivity they drink but little water. Mr. Stephens writes of one that he trapped that was evidently very hungry. Placing it in a cage he gave it grain. He says: "It was amusing to see

the eagerness with which it immediately went to filling its pockets. It stuffed them so full that it must have been positively painful, and then it would not stop to eat, but hunted about for some exit; not finding one, it ejected the contents of its pockets in a corner out of the firelight and went back for more. This time it ate a little, but soon gathered the remainder and deposited it with the first. After eating a little more, it refilled its pockets and hunted about for a better place to make a cache, seeming to think its first choice insecure. These actions plainly show that they are in the habit of storing away their supplies." In some fields where they are common it is said that more than a pint of grain is ploughed up in a single cache.

The elongated hind legs, well pictured in our illustration, give these rats a wonderful power of locomotion. As they leap rather than run, they are often called Kangaroo Rats. Mr. Woodruff states that the specimen, which we have used, when trying to escape started with short leaps, but as it gained headway the spans were about four feet in length and at the highest point about eighteen inches from the ground. He found them quite common in the vicinity of San Diego, California. They are nocturnal in their habits, seeking their food through the twilight and night hours, and resting during the day in their burrows or in shaded places near the openings to them.

When resting the position of the feet and the arched back give them the appearance of a hairy ball. The tail is laid straight out from the body, if space will permit, or when the quarters are cramped it may be curled alongside the body. The tail is quite useful, as it is used as a sort of brace when the animal raises on its hind feet to view its surroundings.

There are a number of species of these interesting rats. The first one was discovered and named in 1839. The species we illustrate was first found near San Diego and named *Dipodomys similis* in 1893.

WINTER VISITORS.

For several years I have been interested in birds. I have watched them through the glad nesting time of spring, have sought their quiet retreats in summer and have heard their faraway calls as they moved southward in the dark, cold, misty evenings of autumn; but for the first time I have succeeded in bringing them near enough to study them in winter.

On the ledge of a second story window, out of the reach of cats, a wide shelf is fastened, and above it the branch of a dead cherry tree is securely wired to a shutter. On the shelf I scatter scraps from the table and shelled corn. To the branch, a long piece of suet is always bound with a cord. This is my free lunch table, spread for all my bird friends who wish to come. They have accepted the invitation beyond my expectation, and have fully repaid me for all the trouble it has been to prepare for them, in the pleasure their company gives me. I sit just inside the window and they appear not to notice me, so that I have an excellent opportunity to note their peculiarities.

The one that comes every day and all day, is the tufted titmouse. He comes down with a whir, looks sharply about with his bright, black eyes, then takes a taste of the suet or marrow, and sometimes carries a crumb away. It is hard to tell how many of them come, as they all look so much alike. Not more than two or three ever come at once.

A pair of downy woodpeckers are constant visitors at the meat table. They seldom come together, but sometimes it is the male with his bright red head spot, sometimes the female, in her plain black and white stripe. She is very plain, indeed, and somewhat more shy than her mate. If an English sparrow comes to the shelf while either of them is on the branch, it quickly drops down beside him as if to say, "See here, you are out of place," and the sparrow leaves without a taste of the good things.

Occasionally a winter wren, with his comical tail and delicate manners, calls on his way somewhere, and makes a

pleasing variety in the appearance of the visitors. He eats all he needs of the bread crumbs before leaving, unless some sudden movement within startles him.

The blue jays are the most persistent and least welcome of all. Their plumage is beautiful, viewed at such close range, but their actions are not pleasing. They flop down near the window and look in, turning the head from side to side, as if suspecting some enemy there. The slightest sound sends them back to the trees, but they soon return, and eat as if they were starved, driving their bills into the meat with quick hard strokes, or grabbing at the corn in a nervous, famishing way. After eating a few grains, they fill their mouths and carry it away to hide for future emergencies. I have seen them hide it in an old gatepost or drive it down in the crevices of trees. They carry away more than they eat and probably never find half of it again, for they have no special hiding place, but they tuck it in wherever they see a convenient place. It is somewhat provoking to have the table cleared in this way, unless it is always watched, for the corn is spread especially for the cardinals whose brilliant color is such a delight to the eye amid the sombre colors of winter. There is one blue jay with a drooping wing. We call him our "Bird with the broken pinion." He appears to have no difficulty in getting to the table, and his appetite is not impaired, but possibly, as Butterworth says, "He will never soar so high again."

A pair of cardinals come and partake of the corn with a grace and dignity befitting their royal apparel. They do not hurry nor worry, but eat slowly and stay until they have enough. They are very quiet now, but their spring song will repay me for all the corn they will eat.

But of all that come, none are more interesting than the chickadee. He surely merits all the bright sweet things that have been said or written about him. He is the only one that utters a note of thanksgiving for his daily bread before he begins to eat. Then he has such gentle, confiding ways. Today the ground is cov-

ered with a deep, sleet-encrusted snow; the trees are all icebound, and it must be one of the most disheartening days the bird world ever knows, yet just now, at four o'clock, two chickadees are singing their good night song outside my window. In a few minutes they will be

snugly tucked away in some wayside inn, some sheltered nook prepared by Mother Nature, where they will sleep away one more cold night, to awaken one day nearer the joyous springtime.

CAROLINE H. PARKER.

BEAUTIFUL VINES TO BE FOUND IN OUR WILD WOODS

III.

Another beautiful vine that grows wild in most of our states is the Trumpet Flower, a popular name for various species of *Bignonia* and *Tecoma*, which belong to the other *Bignoniaceæ* or *Bignonia* family, all of which are either shrubs or woody vines. There are two or three species of this family native to the United States, chief among them being the *Tecoma radicans*, or what is generally known as the Trumpet Flower. In some parts of the country it is also called Trumpet Creeper.

The word *Tecoma* is of Mexican origin and means trumpet, the only known difference between the *Tecoma radicans* and the *Bignonia* is a structural difference in their pods.

We have several imported varieties of both, that come from South Africa and Japan, but none prettier than the *Tecoma radicans* or Trumpet Flower, which any of us can find along almost any roadside or in rich, moist woods, blooming in the greatest profusion in August and September.

It is a woody vine, climbing to great heights by abundant rootlets, produced along the stems. Its pinnate leaves have from five to eleven ovate, toothed pointed leaflets. Its deep orange-red flowers come in midsummer and later and grow in corymbs or clusters; its tubular corolla is funnel-shaped, two or three inches long, with five somewhat irregular lobes, within which the four stamens are enclosed; its fruit is a two-celled pod, containing numerous winged seed.

The Trumpet Flower is found in a wild state from Pennsylvania to Illinois, and southward, and is very common in

cultivation, being vigorous and perfectly hardy, soon covering a large space and reaching to a height of sixty feet. Blooming as it does in late summer, and early fall when flowers are scarce, the abundance of its great orange and scarlet flowers make a very showy spot in a dull landscape, and an especially attractive bit of color, if you happen to find a vine around which the ruby-throated hummingbirds are hovering, they being very partial to the nectar from its flowers.

It is a beautiful vine to drape a tree that is in itself not very pleasing, or to cover brick or stone outbuildings.

Its faults, and it is a shame to discover faults in anything so beautiful, are a tendency to become naked below, which can be remedied by cutting back, an over abundant production of suckers, and its immensely long roots.

Bignonia capreolata, named for the Abbe Bignon, who first found it, is a closely related species, of a more southern range than the *Tecoma*, being found in Tennessee, Virginia and Georgia. Its leaves consist of but two leaflets and a terminal tendril. Its flowers, similar to those of the preceding, are orange. In the southern states it is called cross-vine, as the wood if cut transversely shows a cross.

One species of the Trumpet Flower, the *Tecoma stans*, is a non-climbing shrub of southern Florida and northern Mexico. It grows about four feet high and bears large clusters of lemon-yellow flowers. It is hardy at Washington in the Botanical Gardens and there were fine plants exhibited at the Buffalo Exposition.

J. O. COCHRAN.

THE PERSIMMON.

(*Diospyros virginiana*.)

Have you ever,
On your travels
Through the queer, uncertain South,
Had a 'simmon—
Green Persimmon—
Make a sortie on your mouth?

—Frank H. Sweet.

The Persimmon, or Virginian Date Plum, is a North American tree, growing wild in nearly all of the Southern United States, and will thrive and ripen its fruits as far north as the state of Connecticut and the great lakes. It is one of about one hundred and eighty species belonging to the genus *Diospyros*. These are all hardy trees or shrubs. Representatives of the genus are found in nearly all regions that have a tropical or a temperate climate. The name *Diospyros* is of interest, for it is from a Greek name used by Theophrastus, and is derived from two words, one meaning Jove's and the other wheat or grain. This name of Theophrastus has reference to the edible fruit and literally translated means divine or celestial food.

Only a few of the species are cultivated. These are highly ornamental trees with a beautiful foliage, which is rarely attacked by insects. The common Persimmon of America is the only species that is at all hardy in the north. This and the Japanese species (*Diospyros kaki*) are the only trees that produce the edible fruit commonly found in the market. The wood of nearly all the species of *Diospyros* is hard and close-grained. The trees that yield the beautiful ebony of commerce belong to this genus, and the species that is said to yield the best quality of this wood (*Diospyros ebenum*) is a native of the East Indies and Ceylon. It is also cultivated to some extent in hothouses and in tropical climates.

The common Persimmon of the United States (*Diospyros virginiana*) is a tree, usually growing to a height of about fifty or sixty feet, and rarely reaching one hundred feet. This is a beautiful round-topped tree with more or less

spreading branches. The name Persimmon is of Indian origin and of unknown meaning. The fruit of this species is but lightly appreciated except by those who visit the forest regions in which it is native, for it is only cultivated to a very limited extent. The fruit is globular in form and quite plum-like. It varies both in size, color and flavor. When green the fruit is astringent and has a very disagreeable taste. This, however, disappears when the fruit becomes fully matured.

It is generally thought that the fruit of the Persimmon is not palatable until there has been a frost. Regarding this supposition Dr. L. H. Bailey says: "The old notion of early botanists that this fruit must be subjected to the action of frost before it becomes edible is erroneous. Many of the very best varieties ripen long before the appearance of frost, while others never become edible, being so exceedingly astringent that neither sun nor frost has any appreciable effect on them." This fruit, so popular in the localities where it grows, was not unknown to the natives who traversed the wild woods before the time of the early explorations and conquests of America. A narrative of De Soto's travels relates that his men, who were camping at a native town "halfe a league from Rio Grande" (Mississippi River) found the river "almost halfe a league broad and of great depth," and that the natives brought to them "loaves made of the substance of prunes, like unto brickets." These loaves were made of dried Persimmons, possibly, mixed with some pulverized grain. At the present time, in some southern localities, the fruit is not infrequently kneaded with bran or ground cereals, molded and baked.



PERSIMMONS.
(*Diospyros virginiana*).
Life-size.

AS TO ALLIGATORS.

The alligator generally impresses the mind as a reptile so dangerous that he should be given a wide berth on any and all occasions, yet it is really peaceable and harmless unless aroused to the defensive.

Anywhere south of the Mason and Dixon line, among the rivers, lakes and marshes, are found the alligators, but Florida, because of its great area of such places which the alligator delights in, may almost be termed the home of the alligator.

In traveling through the dense hammocks, where for miles and miles the sun scarcely penetrates through the heavy timber and the rank vegetation beneath, one may often meet with the huge saurian as he travels from one cave or mud hole to another. Tease or wound him, and he will show fight, and woe to him who then comes within reach of his vengeance. And it matters little to him with which end he must fight. He can crush equally well with his tail as with his jaws—or, to end the matter more speedily, he may use both. But if you go on about your business his 'gatorship will do the same, and not notice you so much as ever to wink. Come upon him as he is lying asleep or sunning himself on a mud bank, if he is aroused and finds you between himself and the river he will sweep you aside as you yourself would a fly from the sugar bowl, and then slide into his native element, and he does this so quickly as to allow you little time to explain that you just happened there and had no designs on him whatever.

At other times you might think you are stepping out onto a sunken log imbedded in the mud, but find that the log suddenly gets very much alive, for under that slimy mud and grass an alligator was taking a sitz bath. You might have walked all around him with impunity, but walking on him is an indignity he resents quickly—so quickly that it is a question whether you get back to safety

or are served up for the alligator's dinner. Sometimes you may see an alligator lying motionless just under the surface of the water, with his long snout protruding. His jaws are open far enough to allow the flow of the current through them, and when a stray fish or other tid-bit comes along with that flow, the jaws snap down on it. He can be seen keeping his trap thus set for hours at a time. Should you row near in order to watch him, he will not seem to pay the least attention to you if you behave yourself; but if you drop an oar or shout at him he will drop down out of sight and lie low waiting to see what you are really up to. Now, if you will remain perfectly quiet as to motion, but will imitate the barking of a puppy, the squealing of a pig, or the caw of a crow, although there was not an alligator in sight, you will soon see several snouts appear, and gradually, if you keep up the call, the alligators will come near and nearer, in curiosity as to what the call means. A half dozen or more will be nosing about the boat, and you have a good chance to observe them closely—if your nerves can stand it. This sport is exceedingly dangerous, for if the boat should bump an alligator on the nose, straightway all would make common cause and reduce the offending boat into splinters; and that the occupant of the boat should escape would be next to impossible.

When the female alligator wishes to build her nest, she selects a dry place, open to the rays of the sun, yet near to water. She commences her nest by scraping together a lot of dry leaves, grass or other trash, until she has a round, compact bed as large as a cartwheel. On this she deposits her eggs. This done, she proceeds to cover them up by going round and round the nest and, with her body pushing more leaves and trash over the eggs. A well made nest is of the shape of a hay-cock, and very nearly so large. The nest completed, the alligator goes off to the nearby water, and leaves the sun to do the hatching. Many differ

as to the time it takes for the eggs to hatch, as much depends on the construction of the nest, and also on the heat of the sun. So, also, many differ as to the number of eggs a female will lay in one season. Some aver that eighty is the average number, but the writer has never found more than forty in one nest.

Alligator eggs are white, oblong in shape, about three inches and a half in length, and have a ring around the middle. When first hatched the little fellows are red and black spotted and striped. They are exceedingly lively, and, as soon as hatched, make straight for the water—apparently in search of the protecting care of their mammy—but they often come back to sun themselves about the old nest.

The male alligator is a cannibal, and will eat his own young if he finds them. For this reason the female selects a place far from the usual haunts of her spouse when she prepares for maternal cares by building her nest. And she stays with her babies until she thinks they are capable of wiggling away from dangers themselves.

When in Florida many of the winter tourists secure these little alligators and take them North to keep them as pets. As they are exceedingly slow in growing, they make "little" and "cunning" pets for many years. When they get to be "big fellows," they had best be dispensed with.

Although the alligator has long been considered one of the despised species of animals, or reptiles, it is far from being a useless one—though its use is only practical after it has been killed. One may say that there is no good alligator but a dead one, but one may qualify the remark by adding that the dead one is very good, indeed, for commercial purposes.

There is a great demand for alligator hides, and good prices are being paid for them. Consequently the hunting of alligators for the sake of their hides, and the preparing of them for shipment is a profitable industry. Then the tanning of these hides and, finally, the making of the leather into trunks, valises, purses, etc., makes three distinct industries due to the alligators.

Those making a business of hunting alligators generally take the night time for it, and the darker the night, the better.

Two men, provided with a light, easy-going skiff, a good rifle, an ax, and a bull's eye lantern fastened to the forehead of one of the hunters, start out together. One man—the one with the lantern—sits in the bow of the boat; it is his business to "shine the eyes" of any alligator who might come within the radius of the light. The eyes of the game will shine like two balls of fire, and if the man is careful to make no unnecessary movements, and his partner is careful to scull the boat steadily and silently, they can get so near the game as to almost touch it.

The man in the bow holds, from the very start, the rifle ready for a quick shot. This shot comes so suddenly and so unexpectedly to the alligator, that, quick as he generally is, he falls a prey to his prolonged curiosity as to the nature of that approaching light.

The hunters must be so expert at their trade that as soon as the shot has been fired the man who did the shooting must lean over and grasp the alligator by the tail, pull him half way over the gunnel of the boat and hold him there for the quick cut with the ax in the back, which his partner must be, by this time, prepared to strike. All this is done far quicker than it can be told; so quickly is it done that often the alligator is killed by the ax only, and it is found that the bullet had never struck him, and he had only been either stunned, or so demoralized as to forget his own power.

This cut in the back, severing the vertebrae, places the alligator entirely hors de combat. There is even no flopping about in the bottom of the boat where he is then thrown. Now the hunters are ready to proceed on to their next capture.

The morning generally finds the hunters with their boat loaded, and they are glad of a short rest and—breakfast. There then remains but the task of skinning their game and salting the hides down in barrels, ready for shipment.

LEO L. STRATNER.





FROM THIMEN'S MEDICINAL PLANTS.

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DANDELION.
(*Taraxacum taraxacum*).

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DANDELION.

(*Taraxacum taraxacum* Karst.)

You are bilious, my good man. Go and pay a guinea to one of the doctors in those houses. . . . He will prescribe taraxacum for you, or pil. hydrarg.—Thackeray, Philip, ii.

Dandelion is a perennial herb thoroughly familiar to everyone, as it is found almost everywhere throughout all temperate and north temperate countries. It has a basal tuft of rather large, spatulate to lanceolate, deeply incised leaves. There are several slender, cylindrical, hollow stalks, six to twelve inches long, each one ending in a bright yellow flower head with numerous small flowers. The fully matured fruits form a white, fluffy head and are easily removed and scattered by air currents. Each fruit is a miniature parachute and every child has blown upon the fruit head and watched the individual fruits sail for great distances, suspended in air by the parachute-like expansion of the pappus. Roots are quite large, branching, rather fleshy. The plant contains a milky juice, having a bitter taste.

The Dandelion is said to be a native of Greece, southern Europe and Asia Minor. It has spread very rapidly and widely via the commercial routes. It has become thoroughly naturalized in the United States and Canada, forming the most conspicuous plant in farmyards, along roadsides, meadows, pastures and in orchards. Flowers are matured throughout the entire season, but chiefly in the spring and again in the late summer or early autumn. The plant belongs to the same family as the sunflower, daisy, goldenrod and iron weed.

Dandelion has been used medicinally for many centuries, and the name is derived from the Latin *dens leonis*, meaning lion's tooth, referring to the incised leaves. Theophrastus described the plant and lauded it very highly in the treatment of liver complaints and for freckles. Later (980-1037 A. D.) Arabian physicians employed it very extensively, principally in jaundice and other liver complaints. During the middle ages the

milky juice of this plant was highly recommended in the treatment of diseases of the eye. During the sixteenth century European physicians found it useful as a quieting and sleep-producing remedy.

The poor of nearly all countries collect the young, crisp leaves in the early spring and prepare therefrom a salad, resembling lettuce salad. The poor in large cities visit vacant lots, in which the plants usually grow abundantly, and collect the leaves for home consumption, or fill large, often dirty, sacks, and vend it among the poor tenement dwellers. This is certainly a dangerous procedure, as all manner of dirt and disease germs are found on the leaves, to say nothing of dirty hands, utensils and containers of the collectors. No doubt many a case of typhoid fever or other germ disease among the poor could be traced to this source. In country districts there is little danger connected with eating Dandelion leaves, and they really form a good, palatable salad when properly prepared.

The leaves are also cooked, usually with leaves of other plants (species of *chenopodium*), forming "greens," highly relished by the poor. The American Indians as well as savages of other countries eat large quantities of the leaves raw, more rarely cooked. In Germany and other European countries the roots are collected, dried, roasted and used as a substitute for coffee.

The principal use of this plant has thus far been medicinal, but its value as a curative agent has certainly been overrated. It has been used in dropsy, pulmonary diseases, in stomach derangements, in hepatic or liver disorders, in icterus, blotchy skin and other skin diseases, for biliary calculi, in hypochondriasis, etc. It has no marked curative properties in any disorder. Beyond mildly laxative

and tonic properties it has no effect whatever. Using taraxacum preparations for a considerable length of time causes digestive disorders, mental excitement, vertigo, coated tongue and nausea.

In lawns the plant proves a great nuisance, as it displaces the grass, and it is difficult to exterminate. The plants must be dug up, roots and all, carted away and burned. This should be done

early, before the seeds are sufficiently mature to germinate. For medicinal use the roots are gathered in March, July and November, cleaned, the larger roots cut longitudinally, dried and packed to be shipped to points of consumption. The juice expressed from the fresh roots is also used.

ALBERT SCHNEIDER.

FROM SPRING TO RIVULET.

Still dances the brook with its murmurs gay,
Down through the woods and under the way,
Splashing o'er rocks,—through meadow agleam,
To lose itself in the larger stream.
It passes a laugh with ferns that peer
To see their forms in its waters clear;
It meets a rock, and dashes spray
At moss and lichens that light its gray;
And yet, as it nears where violets hide
'Neath sougning pines, its waters glide
With hardly a sound, lest the tender flower
Should feel, in its haste, too hard a shower.
But ever it sings, be it night or day,
Year after year, in the selfsame way,
 "Here I tinkle, and there I dash,
 I ripple, I murmur, I gaily splash;
 Such a mad, such a glad little brook am I,
 Singing along 'neath a summer sky!"

But just as gay as it is in June
Is the brook as it sings its winter tune.
Jack Frost makes his call,—and droop the ferns;
Again and again the sprite returns,
Till over the pool beneath the pines
A magical covering gleams and shines.
Now hide and seek does the brooklet play,
For it dashes forth once more on its way,
Again to be hidden beneath the snow,
That gives no hint of the songster below.
But the grand old trees that love it well,
And the winter bird,—they both can tell
That ever it sings, as it sang of old,
When winds are bleak and days are cold,
 "Here I tinkle, and there I dash,
 I ripple, I murmur, I gaily splash;
 Such a mad, such a glad little brook am I,
 Singing along when snowflakes fly!"

—GRACE E. HARLOW.

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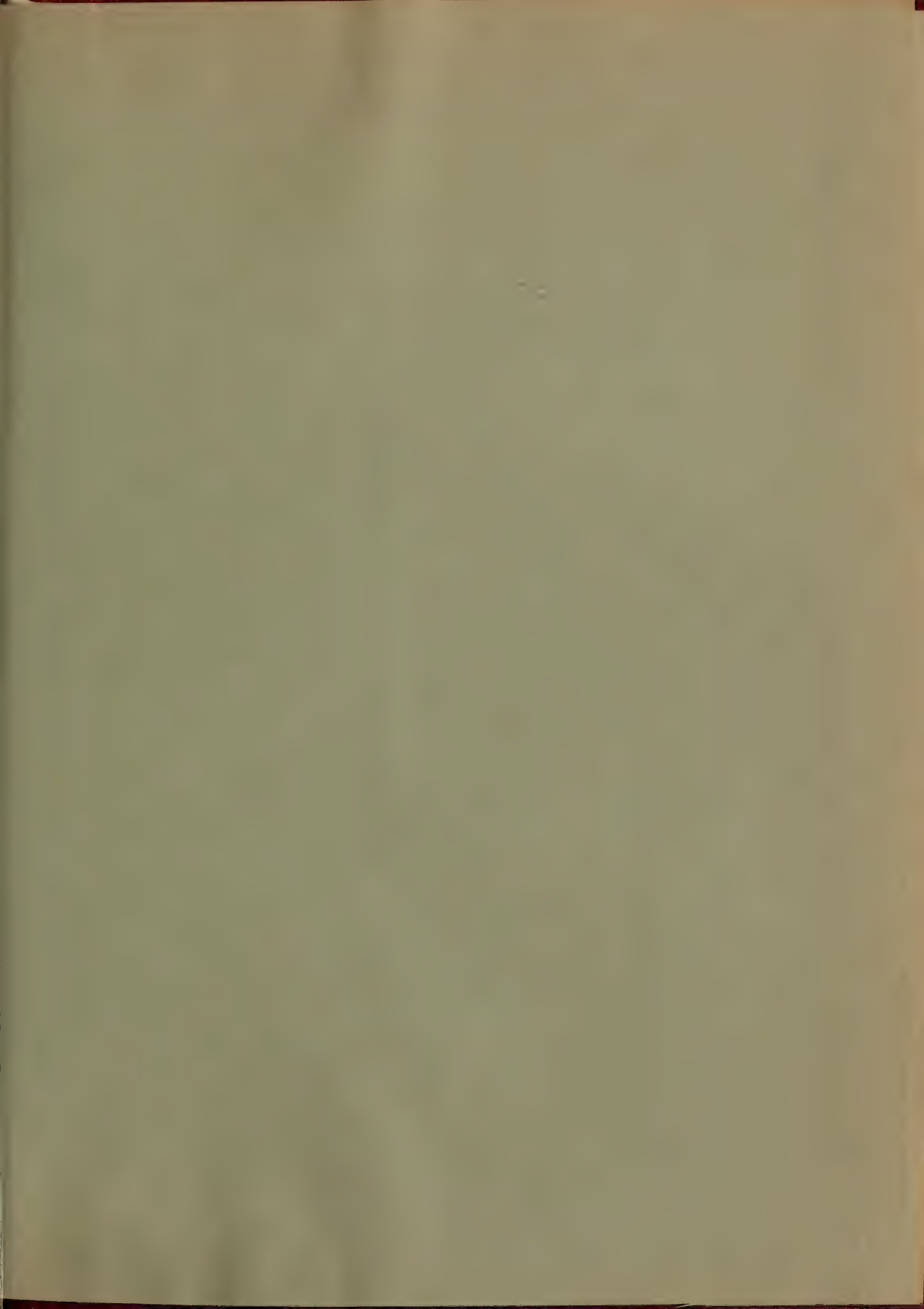
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